MAR. 7, 1952

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TAXES OR INDUSTRY?
. . . Page 18

Paper TRADE JOURNAL

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MATTHEW VASSAR

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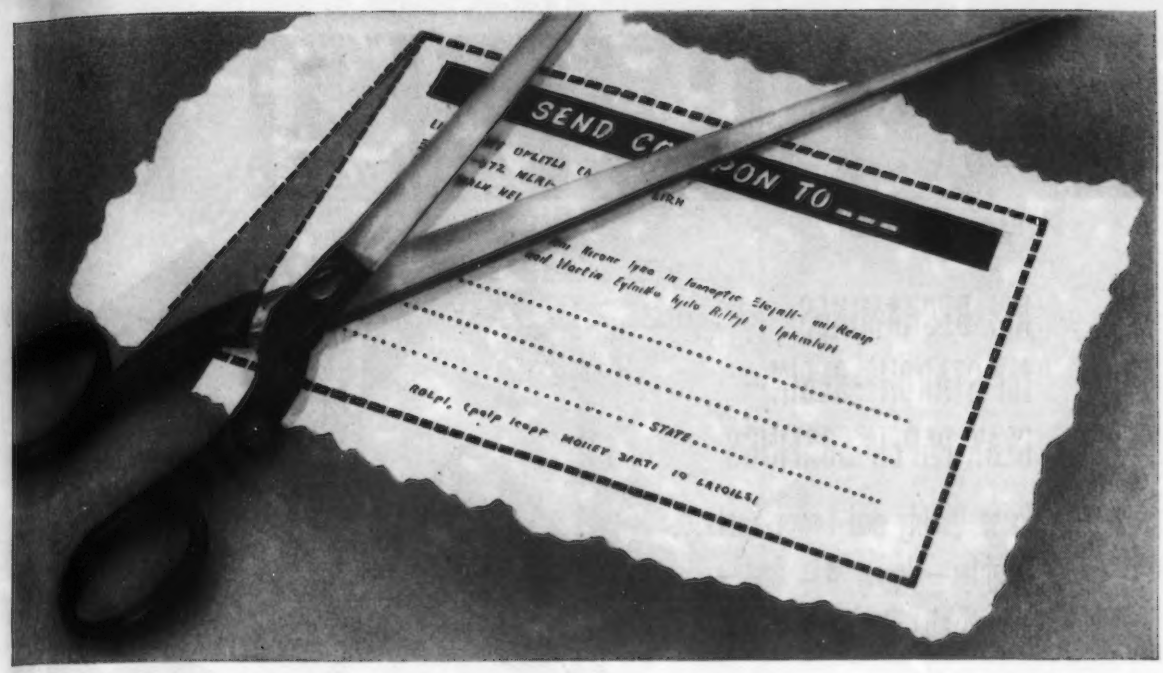

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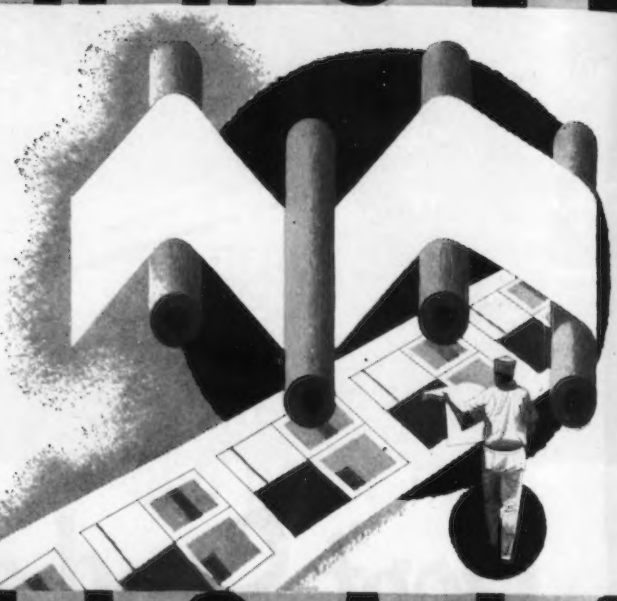

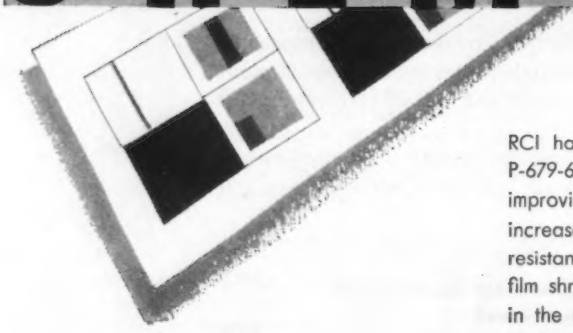

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Paper TRADE JOURNAL

ABP

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PUBLISHED EVERY FRIDAY

LOCKWOOD TRADE JOURNAL CO., INC., 15 West Forty-Seventh Street, New York 36

Phone: PLaza 7-2370

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Entered as Second Class Matter at the post office at East Stroudsburg, Pa., under Act of Congress of March 3, 1879. Publication Office at Lockwood Trade Journal Co., Inc., 34 North Crystal St., East Stroudsburg, Pa. Printed in U.S.A. Copyright 1952 by Lockwood Trade Journal Co., Inc. PAPER established Feb. 17, 1899, combined with PAPER TRADE JOURNAL Nov. 16, 1899. PAPER established Sept. 21, 1910, combined with PAPER TRADE JOURNAL February 19, 1926. All rights to the above titles reserved. Contents of PAPER TRADE JOURNAL, including all articles, illustrations, etc., are copyrighted and may not be reprinted except by permission. PAPER TRADE JOURNAL is indexed in Industrial Arts Index and Engineering Index. Also publisher of LOCKWOOD'S Annual DIRECTORY OF THE PAPER AND ALLIED TRADES.

THIS WEEK

When Cola Parker speaks, it's with sound sensible realism. The tax problem has had its share of theory, hot air, crystal gazing and politics.

Now is the time for sober reflection and Parker brings us down to Earth.

Every man and woman who has our system and its advantages at heart should read and take to heart this message and act upon it.

Unless our tax problem is solved, it will seriously affect your job, your home, your very life and its comfort for which you so earnestly work. Read "Taxes or Industry?"

REMEMBER THESE DATES

MARCH 16-18: **American Institute of Chemical Engineers, Atlanta Biltmore Hotel, Atlanta, Ga.**

MARCH 24-26: **The National Paper Trade Assn., Annual Meeting, Waldorf-Astoria, New York, N. Y.**

MAR. 26-28: Woodlands Section, Canadian Pulp and Paper Assn., Annual Meeting, Mount Royal Hotel, Montreal, Que., Canada.

MAR. 30-31: Packaging Machinery Manufacturers Institute, Semi-Annual Meeting, Hotel Dennis, Atlantic City, N. J.

MAY 5-8: **Third Coating Conference of the Technical Assn., of the Pulp and Paper Industry, at the Sherman Hotel, Chicago, Ill.**

MARCH 10-13: Canadian Pulp and Paper Assn., Industrial Relations Div., Annual Meeting, Montreal, Que., Canada.

APRIL 1-3: National Packaging Exposition, 21st Annual Conference on Packaging, Packing and Shipping, Public Auditorium, Atlantic City, N. J.

JUNE 17-19: American Pulp and Paper Mill Superintendents Assn., 33rd Annual Convention, Book-Cadillac Hotel, Detroit, Mich.

JUNE 18-20: Canadian Pulp and Paper Assn., Technical Section, Annual Meeting, Murray Bay, Que., Canada.

JUNE 19-21: Empire State Section of TAPPI and the Niagara Branch of Tech. Section, Canadian Pulp and Paper Assn., Joint Meeting, General Brock Hotel, Niagara Falls, Ont., Canada.

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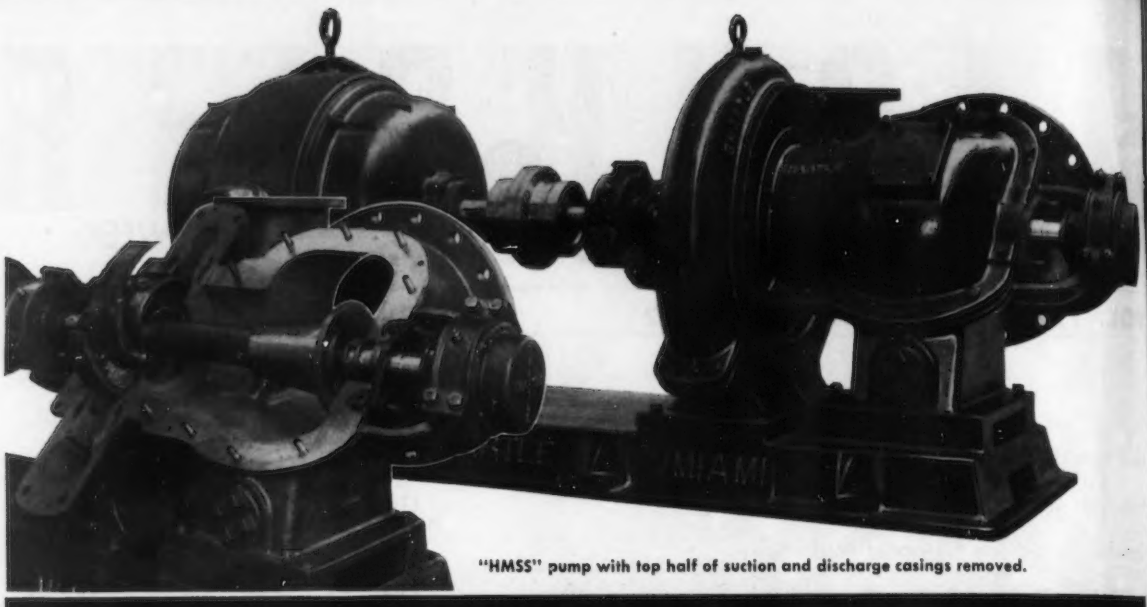

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NEW Shartle fully split Side Suction Centrifugal

The Miami "HMSS" pump is a heavy duty side suction stock pump especially designed to handle high density pulp and paper stocks. Will pump practically all types of stock and is available in several sizes, with capacities ranging from 100 to 3700 G.P.M.

• DIAGONALLY SPLIT SUCTION and DISCHARGE CASINGS make it possible to remove vertically, the complete rotating element without disturbing piping connections—an exclusive Shartle-Miami feature.

• LARGE SIDE SUCTION flanged for standard piping connections or furnished with a—

• HORIZONTAL SUPER SUCTION that can be grouted into wall of chest. This arrangement is provided with a hand-wheel operated Shartle slide valve for shutoff. A large vent opening is provided in suction casing to quickly release air should air binding occur in the pump.

• HEAVILY CAST BASE AND CASINGS—makes for rigidity and vibration-less operation.

• OVERSIZE shaft carried in short centered anti-friction bearings. Impellers specifically designed to suit stock and pumping conditions.

• SPIRAL RIBBED SIDE PLATES, an exclusive Shartle-Miami feature that prevents rags and strings from plugging between the impeller and side plates, and allows closer clearance for greater efficiency.

• DRIVE ARRANGEMENT: To suit mill requirements for either direct connected or belt drive.

• MATERIALS: Furnished in any material or combination of materials to suit stock conditions.

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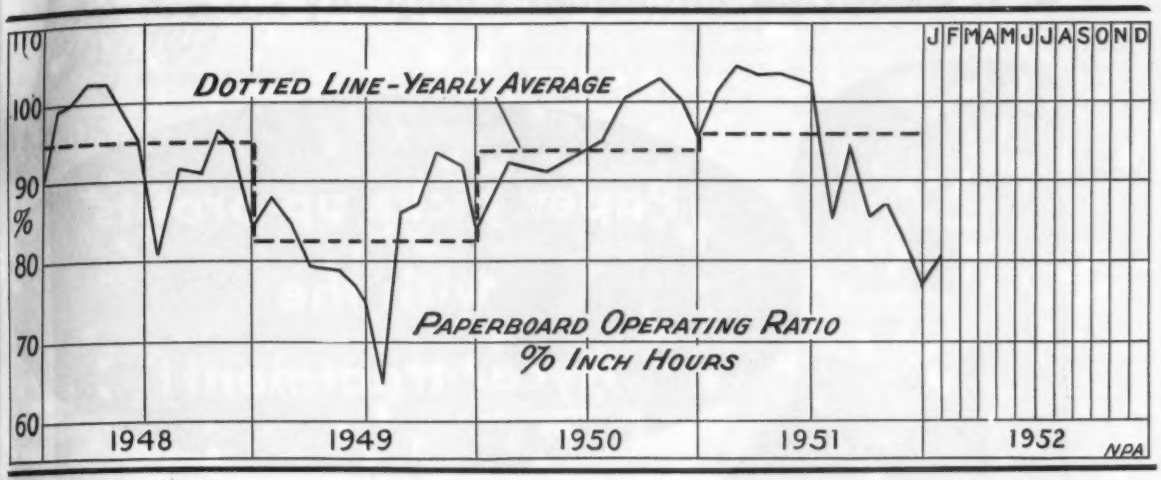
OUR BUSINESS



Brief of Important Figures

Source	Production	WEEK ENDING Feb. 23, '52	Jan. 26, '52	Feb. 24, '51
APPA	Paper Production Percent Capacity[3]	97.3	99.5	102.4
	Unbl. Kraft Paper Production Percent	95.3	99.5	92.6
NPA	Paperboard Operating Ratio Percent Inch Hours	87	85	105
		Jan. 1952	**Dec. 1951x**	**Jan. 1951**
APPA	Paper Production* (Except Newsprint and Building Papers) ....Tons	917,000	862,151	892,000
	New Orders ....Tons	963,000	820,265	936,360
	Unfilled Orders ....Tons	935,000	870,769	910,835
	Shipments ....Tons	899,000	863,959	885,000
		Jan. 1952	**Dec. 1951**	**Jan. 1951**
NPA	Paperboard Production ....Tons	903,461	757,914	1,176,679
	New Orders ....Tons	962,138	768,320	1,349,991
	Unfilled Orders ....Tons	405,520	358,720	761,828
	Our Customers Activities Index[1]	**Latest Mo.°**	**Previous Mo.°**	**Year Ago°**
FRS	Manufactures Total Index	226	229	227
	Durable Mfg. Index	278	277	266
	Nondurable Mfg. Index	185	190	196
	Chemical Products Index	303	303	288
	Mfg. Food Products Index	153	162	161
	Printing and Publishing Index	178	183	179
ODC	Magazine Advg.-Printer's Ink Index	357	347	319
	Retail Sales Combined Adjusted Index	387.6	384.2	374.7
	Drug Index	247.0	247.3	241.2
	General Merchandise Group Index	400.1	404.1	399.6
	Grocery and Combination Index	468.0	459.0	426.5
	Prices Index			
BLS	Consumers Price Index[1]	189.1	188.6	178.8
	Wholesale all Commodities	113.5[4]	178.3[2]	175.3[2]
	Wholesale Foods[2]	187.3	188.8	179.0
	Commodities other than Farm Products and Foods[2]	166.9	166.9	166.7
	Wholesale Pulp and Paper	118.4[4]	201.1[2]	189.0[2]
	Purchasing Power of Dollar, Consumers Prices[1]	52.9	53.0	55.9
	General Activity Index			
FRS	Mfg. Production-Worker Payroll	429.4	434.1	426.0
	Unemployment Compensation Initial Claims (M)	1,151	948	1,051
	Miscellaneous Carloadings-Thousands of Cars	1,747	1,524	1,814
	Electric Output (Million KW hr.)	38,459	37,313	35,821
PTJ	Average 32 P & P Common Stocks as of March 1	$35.70	$37.01	38.39

[1] 1935-39 = 100 Unadjusted Index.
[2] 1926 = 100.
[3] New 6-7 day basis.
[4] New Index 1947-1949 = 100.
* For details see APPA Monthly Statistical Summary—January 1951 Estimated Figures.
° Latest Month Available on Request.
x Revised figures.

News about

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Paper TRADE JOURNAL

TRENDS

Office of the PAPER TRADE JOURNAL,
Wednesday, March 5, 1952.

A highlight of the recent APPA Convention not reported last week for want of just space was the subject of foreign markets for U. S. papers and products.

Always a major interest to this writer, the widening opportunities for U. S. paper output in other lands are impressing themselves on enterprising industry executives, also on an increasing number of foreign sales agencies.

Per Capita Consumption Figures

From the viewpoint of opportunity and world need for paper, a glance at apparent comparative per capita consumption figures, as compiled by the Export Committee of the APPA and released February 21, shows Central and South America with 17.08 lbs. per capita, compared with the 1950 North American figure of 371.37, with an estimated U. S. figure for 1951 of 400.0 lbs.; northern Europe with 101.87 (a drop of 14 lbs. per capita from the 1949 report); Continental Europe at 42.47, compared with 48.51 in 1949; Africa, 6.47; Near East, 2.69; Asia, 3.33; Australasia, 75.18 lbs., compared with 98.49 in 1949.

A breakdown by countries also reported in the Special Statistical Studies, No. 1, shows some African and Asiatic areas with less than a half-pound per capita; and several political sub-divisions of Continental Europe with much less than 30 lbs. per capita per year. Noteworthy is the fact that several of these latter have shown themselves eager to buy U. S. woodpulp at ceiling prices, thus have dollars to spend.

Discuss Need for Sound Export Policy

Values of the export market to the U. S. paper mill were presented to the Convention meeting of the export committee by various speakers, and the need for a sound export policy by all paper mills was stressed.

Tracing the movement of U. S. business during recent business eras and their relationship to export trade, speakers told of the disastrous effect of emptying on foreign markets the overflow of domestic demand without regard to price or profit, so long as the mills were kept running. Spoken of also were years 1939-40, when the markets thus opened to the U. S. product tried to buy more. Domestic demand, however, was then consuming all that could be produced, and export trade became an orphan to all but those mills which had established an export sales policy.

Difficulties of trading in wartime: deliveries, exchange problems, war hazards, etc., were described as opportunities for developing confidence in sound business dealings of U. S. business. Emphasized was the fact that foreign buyers are loyal and faithful, that they remember well those firms which have built a reputation for quality of product and business dealings. Deplored by the speakers was the reputation U. S. export won for itself because of instability in market in-and-outisms, while the Europeans have a conservative, steady policy of pricing and quota which encourages international trading.

In other words, in contrast to those few mills which maintain a steady quota of their output for export, regardless of domestic demand, too many mills are in and out of international markets as domestic conditions warrant. Related to current market easing: foreign markets would be sought by some producers to keep their mills at capacity output.

Market Easing and Our Responsibilities

Accepting as fact that during times of sustained market easing, the so-called *marginal* producers quit the market, there is in today's picture a distinctively different element.

A large number of industry executives hold to the belief that business generally will snap back quickly from present easing — quickly in degree rather than in time lag. Thus they desire to keep their mills in condition to roll again quickly.

But for this expectation, some of the marginal mills might close permanently. As it is, many will try to keep operating, with a market hazard that they may become overanxious, pricewise.

Overheard last evening was a group of textile men describing "terribly depressed market conditions." Admittedly, they said, there is a fair volume of business, but there is so much price-cutting that no profit can be made. There is so much stuff on the market that no matter how much the price is cut one day, it still is too high the next day. As one put it, if you can sell at something more than cost, you'd better sell it.

Of such stuff is price-breaking made. Of such anxiety and confusion and uncertain philosophy is the export market exploited.

Paper Trade Journal's editors are firm in the belief that the U. S. paper mills must develop sound steady policies for maintaining world markets. Recognized the currency and exchange problems, other areas of rising literacy call for more paper than their domestic mills can provide, more than their Scandinavian woods and industry can hope to supply. Of significant importance also is that some of these countries are an all-important source of our strategic defense materials. In concert with convention speakers, we emphasize the need for quality product at normal pricing for export.

Some have cynically commented that Christian missionaries were followed by businessmen who exploited the natives, and left the areas sensitive to Communist infiltration. In export trade, through sound business, sound philosophy and good manners there is presented to U. S. business a responsibility to sell democracy and the private enterprise system just as definitely as the "Voice of America" broadcasts. In the words of one writer, "How can I hear what you *say* you are when what you *are* is sounding so loud in my ears?"

Printing and Book Paper Prices

This large volume segment of U. S. paper output is one which ultimately must serve some portion of world areas. Reporting on today's conditions and prices, the outlook for this area is good.

Indicative of market strength is the recent advance in prices of brush-coated book papers, machine coateds, uncoateds and offset to CPR 106 authorized ceilings. Rises of 15c a hundred pounds on brush coateds, 30c on machine coateds, and 40c a hundred on uncoateds and offset are pretty general, and became effective either in late January or early February. Because of extended weakness in brush-coateds, not all mills raised their prices. Others which were at the high of market range made no advance. Indications are that some prices are still below the CPR 106 ceilings, though market coverage is not yet completed.

For a rundown of price changes, see *Prices* page.

Wholesalers acknowledge that February business has been good, compared with 1950's months, but that in contrast to recent months of high pressure it has been just plain dull. For the most part, their inventories of wanted grades are not adequate. Sulfites continue tight though easier to obtain. Groundwood book stock is everywhere reported tight.

The mills are operating at close to capacity with good-sized order backlogs. They are, however, now looking for more business, and salesmen everywhere are doing energetic selling, customers shopping for quality, price and service.

Overseas Pulp Prices

Sources in London and Oslo report that one Swedish, one Norwegian, and two Finnish producers have offered to supply Britain at reduced ceilings of £88 for bleacheds, metric ton, c.i.f.

Second-quarter Swedish prices to West Germany are named at 1320/1345 krona for bleacheds, 1200 for unbleacheds, metric, c.i.f., roughly about $210/220 and $195 respectively, per short ton, on dock. —E.P.N.

Paperboard Production (Tons)*

	Feb. 23 1952	Feb. 16 1952	Feb. 24 1951
Production	211,365	214,477	251,715
New Orders	173,188	170,485	201,026
Unfilled Orders ...	355,934	396,837	663,339
% of Activity	87	87	105

* Source: National Paperboard Assn.

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News of the Week

Paper TRADE JOURNAL

Blast from the Trumpet of Doom!

Let it be fully understood that the pulp and paper manufacturers have never been afraid of the cold hard facts of business life. They are in business to make paper in ample supply so all may use it lavishly. They have done this for 50 years and are now planning for the next 50—.

Henry J. Percy

Your editor who had been spending Paper Week at the Waldorf-Astoria with optimistic, prosperous, astute and able mill owners and executives was rudely awakened on February 21 by frantic phone calls from investment houses asking if they should dispose of their paper holdings as the business had taken a serious reversal, according to the *Wall Street Journal.*

The front page column was filled with such statements as "I have to fight my way into the office nowadays to get past paper salesmen."

A paper mill man is quoted as saying, "Our business went from boom to bust in just six months. If it weren't for Government orders for waterproof grades, we'd be in sad shape right now."

A purchasing agent is quoted as saying, "Mill salesmen are quoting some kraft (wrapping paper) grades at 6 to 8 cents per pound less than a year ago."

"Paperboard prices $5 to $6 off and deliveries within 30 days."

"Kraft shipping containers carload delivery within 5 days."

"One thousand tons Swedish newsprint offered at $200 — no takers."

"Coated grades are loosening enough now that three cars go begging for everyone that is sold."

Two full columns of the latest information from *mill customers* were developed.

* * *

If these were *all* the facts and they were *true,* maybe there would be cause for uneasiness. But let's look at the sources of the writer.

The first statement was made by a man who is or recently has been a consultant to the State Department. His job in that agency was to sell via direct mail, the American System of Free Enterprise. I cannot believe that he is alarmed because paper has become competitive. I know he believes that competition is the Keystone of the American System.

Next the "Boom or Bust" paper company executive ought to know what has happened to his own business. It does seem to us that neither the operating ratios nor the tonnages produced show this fact to be true for the whole industry. Could it be that his sales force has slipped and his merchandising methods have become obsolete?

Paperboard prices have declined in some cases. There are always sharp shooters in any market. With the supply of waste paper in excess of demand and a decline in waste paper prices, it is only logical that savings in cost will be passed on to the consumer when high cost inventories are worked out.

The cuts in kraft (wrapping paper) grades seem to us to be rather hard to swallow. The OPS ceiling is only $7.75 per 100 pounds. Cuts of $6 to $8 seem fantastic unless the quoted purchasing agent has been active in the black market.

Missing from the whole story is any knowledge that the pulp and paper industry has doubled its production since 1939, and still had more orders than it could reasonably fill. No mention is made of the billion dollars spent and being spent since 1946 to make paper and its products freely available at prices only high enough to realize a fair return on investment.

No thought appears to have been given to the real facts of the situation. How easily they could have been obtained from *Paper Trade Journal.*

Could the *Wall Street Journal* have become the "Fall Guy" for those anxious to really start a deep price reversal? Whether this is sloppy reporting or cat's paw writing, these men may be unconsciously doing irreparable damage to their own businesses. As one investment house put it, "Sounds like another sour note from the trumpet of doom."

Felts from Synthetic Fiber

F. C. Huyck & Sons reports the first successful run on a papermaker's felt made of 100 percent synthetic fiber.

This felt was run in the Camas, Wash., mill of the Crown-Zellerbach Corp. on a high speed Yankee Fourdrinier machine making lightweight papers. Its life substantially exceeded the average on this position and it gave free drainage throughout its life with no evidence of filling. This development is the result of a long term research program involving many synthetic fibers and manufacturing techniques. As paper machines have increased in speed, it has become necessary to build stronger and tougher felts to withstand the physical attrition to which they are subjected under these extreme conditions. To do this without adversely affecting the drainage properties of the felt has presented an increasingly difficult problem. It would appear from this test run that man-made fibers and new manufacturing techniques may hold the answer to the problem, permitting even higher operating speeds than have been thought possible in the past.

Donohue To Increase Newsprint Production

Donohue Bros., of Quebec, is spending $1.6 millions to convert part of its surplus groundwood into newsprint so that its newsprint production capacity will be increased by 12% to approximately 72,000 tons annually by the end of this year.

Ted Lyman Honored

Edson R. (Ted) Lyman, vice-president of Missisquoi Corp., former president of SAPI, was given the annual President's Award for making the greatest contribution to the Salesmen's Assn. of the Paper Industry in 1952.

India's New Bleached Bagasse Pulp Mill First in Commonwealth

Some details are now available of India's new bleached bagasse pulp plant which was recently started up at the mill of Rohtas Industries Ltd., Dalmianagar, Hihar. The new plant soon reached its rated capacity of 20 tons of bleached pulp per day and makes history in two ways:

Bagasse is used for high-grade bleached pulp production for the first time in the Commonwealth. The Rohtas plant is only the second in the world making bleached pulp from this material — the first is the Cia. de Celulosa de Filipinas in the Philippines which for several years now has been producing banks, bonds and manifold papers containing approximately 95 percent bagasse fiber.

India has her first all-continuous pulping plant. It was designed and supplied by Cellulose Development Corporation Ltd. on the lines of the continuous soda-chlorine plants already pulping straw elsewhere.

The bleached pulp produced by Rohtas is mainly used at present in high proportions mixed with bamboo in the white surface of the duplex and triplex boards for which the mill is well-known; these boards are converted for playing cards, fine art boards and cigarette cartons.

Pending the arrival of the two new paper machines which are on order specially for the bagasse pulp, it is planned temporarily to restrict the mill's existing bamboo pulp production and to use more bagasse.

When using bagasse, one of the problems is to store the material until it is required for use; the pulp mill naturally operates all the year round whilst the sugar-crushing season lasts only a few months. The wet bagasse is made into high-density bales, and stored in stacks of about 2,000 tons, preferably under cover. When the bagasse leaves the sugar mill it contains about 45 percent moisture, but during the course of several months' storage in the manner described this moisture dries out to about 12 percent; the bales then weigh about 45 lbs. and are convenient for handling. There is no danger from spontaneous combustion when bagasse is stored in this way.

Prior to pulping, the bales are first broken up in specially designed disintegrators and unwanted material is removed. The good fiber then goes forward to be soaked with caustic soda of appropriate strength and commences its passage down the continuous Celdecor digestion tower, heated by steam jackets. Continuously extracted from the digestion unit, the pulp is washed in two stages, subjected to mechanical treatment and partially dried before chlorination in a patent continuously-operated tower. The chloro-lignins formed are then washed out in a weak alkaline solution, followed by rough and fine screening in three stages by Celdecor-Kamyr flat and rotary screens. The pulp is now ready for bleaching, which is done at Rohtas in a single hypochlorite stage.

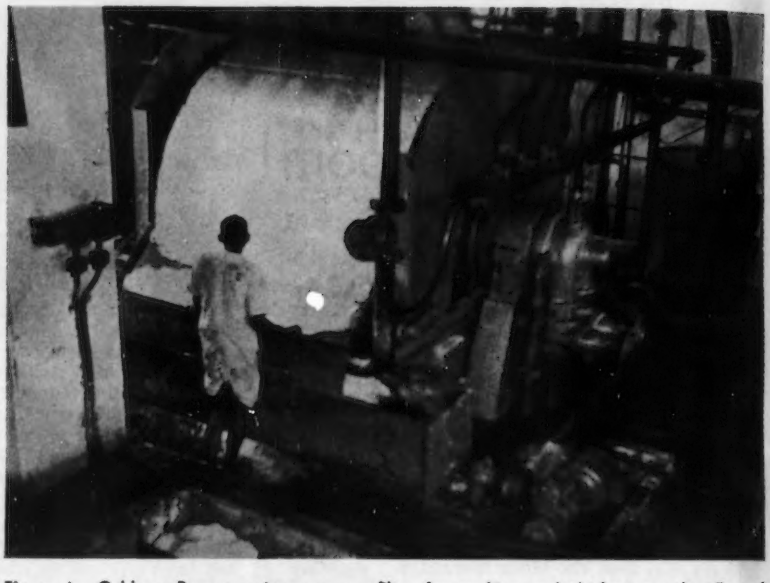
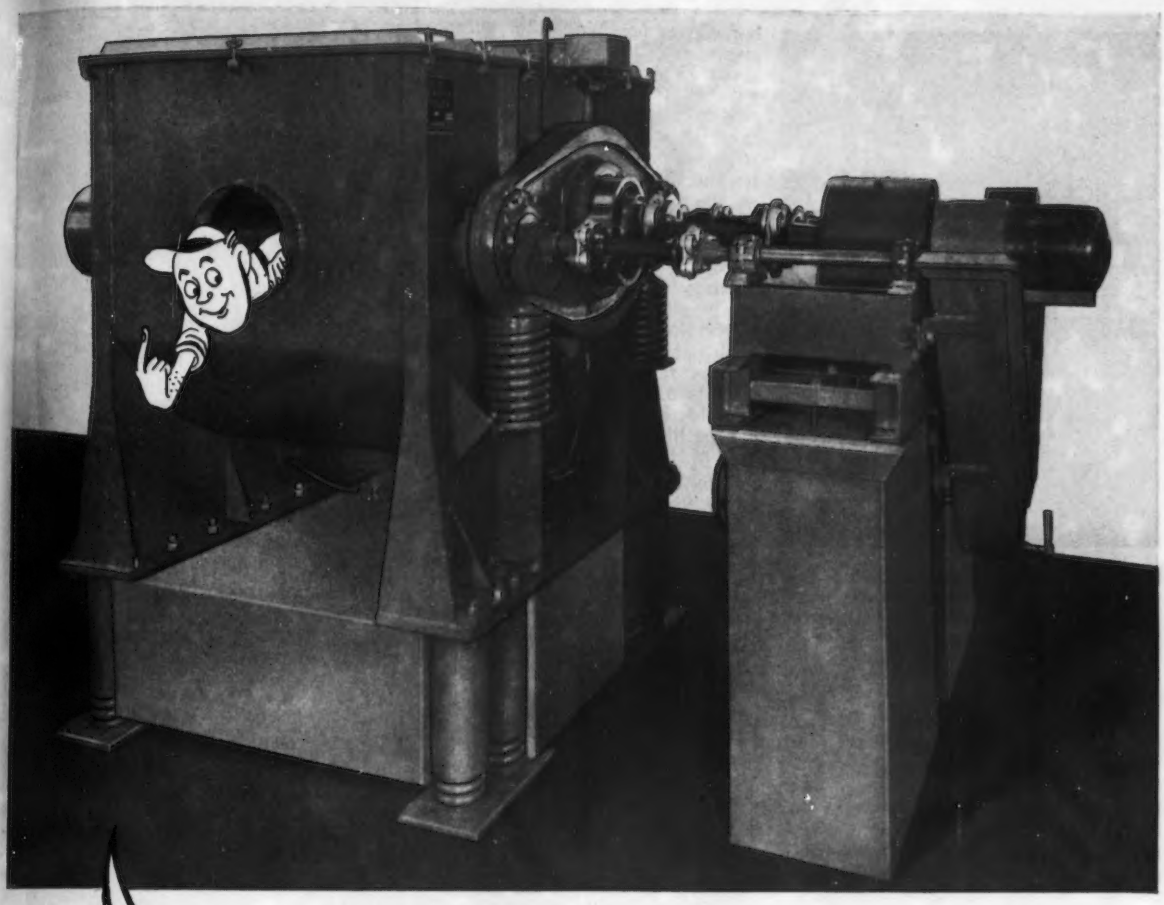


Figure 1.—Celdecor-Paxman rotary vacuum filter for washing and thickening pulp. Four of these filters are included in the plant.

Figure 2.—Steam inlets to the vertical Celdecor continuous digestion unit in which the cleaned bagasse receives its initial treatment.

The first bleached bagasse pulp at Rohtas was used for M.G. papers, containing progressively 30 percent to 100 percent bagasse. At first some difficulty was experienced with sticking at the paper machine presses, but this was soon corrected in the beating. The 100 percent furnish proved the pulp to be free running on the wire, that the color was superior to that of bamboo or sabai pulp, and that excellent strength and formation were obtained. The pulp takes a good finish from the M.G. cylinder, added to which only about one-sixth of the beating time is required compared with bamboo.

There are four vacuum filters, which are of the Celdecor-Paxman low-submergence type already successfully proved on straw and esparto. The washing after digestion is laid out for soda recovery which will be put into operation shortly. The pulp mill is supplied by chemicals from the mill's own



WANT TO GET IN ON A GOOD THING?

This BIRD VIBROTOR SCREEN is something on which to get inside information.

It uses slotted, undercut screen plates in combination with intense, controlled vibration and rotary action to deliver:

high capacity — 50 to 90 tons of well screened stock per day

at high consistency — 1.3 to 1.6% or higher

at low cost — power per ton of stock is a small fraction of a horsepower.

Why not find out what it can do on your stock?

BIRD MACHINE COMPANY
SOUTH WALPOLE • MASSACHUSETTS

Figure 3.—Gas chlorination in this Celdecor three-tube tower, followed by alkaline treatment, completes the isolation of cellulose from the bagasse. Screening and bleaching follow.

electrolytic plant and chlorine is fed straight to the towers from the cells in the condition in which it is produced, so avoiding the necessity for drying and transport.

The start-up of this mill demonstrates new possibilities to a world increasing conscious of wood pulp shortage and high prices. Iron Curtain and dollar barriers have intensified the shortage of paper-making raw materials for many countries which do not have an adequate supply of native soft woods, and yet it is estimated that there is over 20 million tons of bagasse fiber produced each year throughout the world by the various cane sugar mills. Much of this is burnt at present in the sugar mill's own boiler plants to raise process steam. Even so, many mills are embarrassed by a surplus of bagasse and it becomes quite a costly item to arrange for its disposal by incineration.

Wet bagasse as normally fired has a calorific value of 4,500 BTU's per pound, which compares with coal at, say, 11,500. Moreover, to use as much bagasse as possible, boiler furnaces at sugar mills are generally made only about 55 percent efficient, as compared with 78 percent to 80 percent for a coal-fired boiler. A 20 percent reduction in bagasse consumption for the steam-raising power is effected by burning dried bagasse instead of wet, as the efficiency then rises to about 67 percent.

Thus no problem really exists for liberating sufficient bagasse for paper-making, since the efficiency can be much improved on the one hand and conversion to coal or oil burning carried out as required on the other. Rohtas raise about half their steam with coal. Generally speaking, it can be said that one ton of dried bagasse can be liberated by the substitution of half a ton of average coal or the equivalent quantity of oil fuel. The value of bagasse as a paper-making fiber much exceeds its value as a heating medium and the cost of replacing it with alternative fuels. It is one of the cheapest paper-making raw materials in the world, and in India, for example, its successful introduction may prove to be as far-reaching as was the first bamboo pulp mill.

Other Celdecor plants for pulping bagasse are at present under construction in South Africa, Brazil and Mexico.

A.P.W.

ONLIWON

INDUSTRIAL
TOWELS
TISSUE

Another Pulp Mill for B. C. Interior

A new company, Kootenay Forest Products Ltd., backed by Washington interests, recently announced that it plans a pulp mill near Nelson, B. C.

The Glacier Lumber Co. of Nelson has been bought by the new company and modernized. At present it is seeking a 400,000-acre forest management license for forests in the Duncan Lardeau River drainage basins.

The new pulp mill will cost approximately $20 million and is expected to provide employment for about 1600 workers.

Another Indication of A Pulp Mill at Kitimat?

Hecate Development Ltd. have applied for a forest management license in the Kitimat, Douglas Channel and Grenville Channel area. This is believed to be another step towards the proposed establishment of a pulp mill at Kitimat as an offshoot of the development of the Alcan Co.

The license requested would cover an estimated 350,000 acres of timberland. Allowable annual cut would be approximately 80 million board feet.

Exton Paper Co. Starts Tissue Mill

The Exton Paper Mfg. Co. is operating a new tissue mill near Downingtown, Pa., with a daily output of from five to six tons of M.G. tissue. M. A. Hesser is president and general manager.

W. E. Bright of Rice Barton and R. J. West, general superintendent of Stevens Paper Mills, Inc., watch Peter Della Luna, mill superintendent, "miking" some capacitor paper made on their No. 6 Rice Barton Machine at Stevens' Lower Mill, Westfield, Mass.

Stevens Makes Capacitor Tissue

Capacitor tissue (more commonly called condenser tissue) is used as the spacer insulation component in all dry type capacitors. Since capacity varies inversely as the thickness of the dielectric spacer, there has been considerable continuous pressure to reduce the thickness of capacitor tissue. Thus, on a machine whose dimensional tolerances are spoken of in the thousands, paper is produced whose total thickness is two-ten-thousandths (0.0002″) and whose tolerances are plus or minus one-hundred-thousandths (0.00001″). Paper for electrical insulation in the capacitor and coil field is manufactured from 0.0002″ to 0.005″.

This closely controlled thickness is but one of the essential properties of this paper. The structure and formation of the sheet has to be engineered so that the resulting paper will meet several physical, chemical and electrical requirements. The paper must have a closely controlled density (usually 1.0 grams/cc.), has to be practically impervious to air, must contain only a minimum of conducting particles, cannot contain electrolytes, must have a neutral pH and then beyond all that it must have good dielectric strength, good insulation resistance, low power factor and long electrical life. These are really rigid requirements.

C-Z Expansion Off

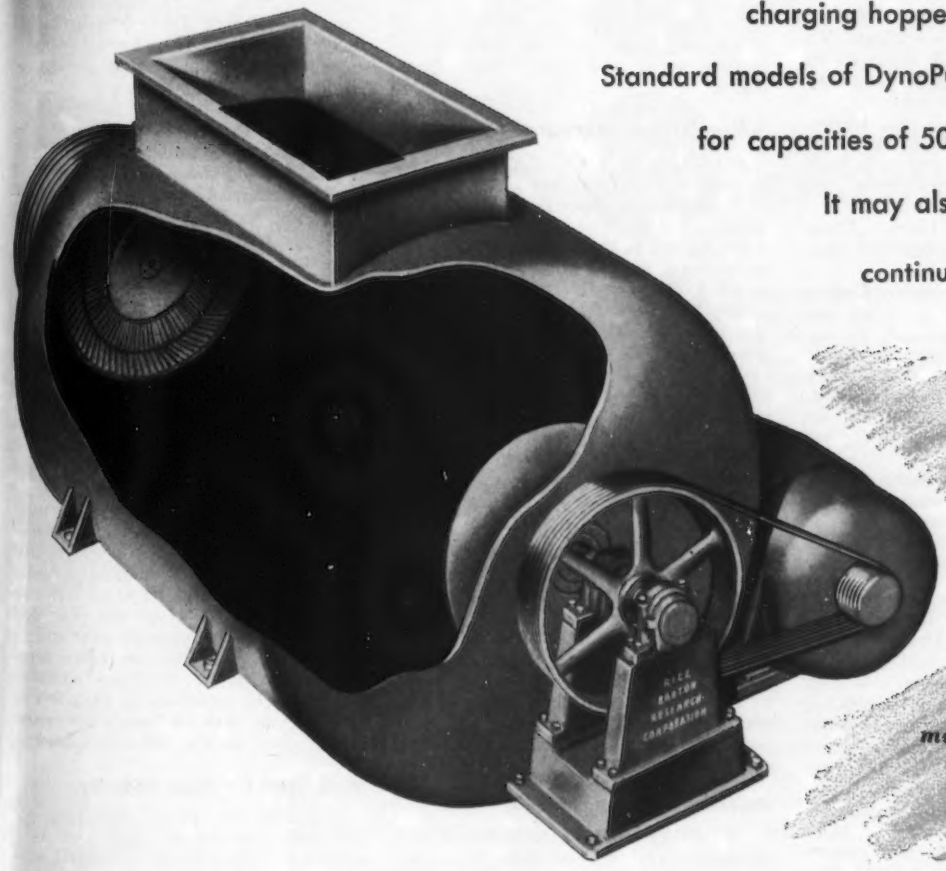
Crown Zellerbach Corp. has called off, for the time being at least, its $19 million expansion. Shortages of stainless steel and copper are the reasons given, as they affect the orderly completion of the project. Furthermore, current construction under "certificates of rapid tax amortization" will give ample facilities to meet defense needs.

RICE BARTON

DynoPulper

is comprised of a horizontal circular vat, having two DynoPellers. Stock may be charged all at one time, in bale or loose form, through the topside charging hopper.

Standard models of DynoPulper are designed for capacities of 500 to 2000 pounds. It may also be arranged for continuous discharge.



Laboratory size models are available.

● The DynoPeller

is the heart of all DynoMachines. Its concave face is lined with rough, hard carbide particles. As the DynoPeller rotates it causes a suction at its center that pulls the stock toward it. Centrifugal force then causes the stock to flow rapidly over the rough carbide particles under a gentle hydraulic pressure. This effective dynomizing action completely disintegrates the stock . . . separating each fiber from its neighbor while maintaining its original length.

RICE BARTON
Research Corporation
WORCESTER 1, MASS.

GOVERNMENT GOSPEL

Controlled Materials Distribution

WASHINGTON, D. C. — Distribution of certain controlled materials by the Defense Production Administration to NPA for the second quarter, includes 1,594,396 tons of steel for the Container and Packaging Division of NPA, 288,000 pounds of copper and copper base alloys and 19,561,000 pounds of aluminum for the same purpose.

For the Pulp, Paper and Paperboard Division of NPA, steel allotments for same quarter were 1,001 tons; copper, 41,000 pounds, and aluminum, 26,000 pounds.

NLRB Decisions

WASHINGTON, D. C. — Latest National Labor Relations Board cases included several in the paper industry. Decisions reported included:

American Paper Stock Co., Indianapolis, Ind., election ordered by February 22 covering all truck drivers, helpers, warehousemen, production and maintenance employees;

National Container Corp., Tomahawk, Wis., time extended for election;

Cheney Forest Products, Central Point, Ore., time for election extended;

Gaylord Container Corp., St. Louis, Mo., election ordered by March 2 for electricians; Lily Tulip Cup Corp., Los Angeles, same by March 1, for press cutters, cover press operators, et. al.;

Bruce Carton Co., Memphis, Tenn., production and maintenance employees voted for CIO Paperworkers.

Waste Paper Supplies

Supplies of waste paper are adequate and should remain ample throughout 1952, the Waste Paper Dealers Industry Advisory Committee told the NPA.

Waste paper, used as a substitute for woodpulp, constitutes a "secondary forest," NPA said. Last year the waste paper used in the manufacture of cardboard, paper board and certain lower grades of paper was enough to preserve a forest the size of Connecticut. Waste paper is found in about four types or grades: mixed, newspapers, corrugated, and what are termed high grades such as writing or bond paper cuttings.

Dealers said that the most important problem facing the industry is that of getting enough business.

In a discussion of the paper industry in general, NPA said it is considering modifying Order M-72 (Chemical Wood Pulp), but aims to retain restrictions on the usage of white pulps. The committee saw no objection to such contemplated action.

The committee also discussed methods of recognizing wet strength paper and board waste which are difficult to handle and process. An NPA spokesman described an experiment with a "Waring mixture" into which a small quantity of suspect paper is fed. After running the mixer for two minutes, most paper samples are entirely chewed up, but if it is wet strength, particles remain, he said. Thus the suspected paper can be separated easily from other waste mixtures.

The committee heard a report on mill inventories. It showed that all mills have ample supplies of waste paper on hand and cannot take on any more at present.

Waste paper dealers reported no difficulty in obtaining baling materials and equipment, though balers themselves are difficult to get. NPA pointed out that it has given priority assistance to obtain balers to those who manufacture paper and paper board from waste.

Sulfur Stocks Increase

WASHINGTON, D. C.—A slight gain in sulfur stocks on hand at the end of January was reported by NPA this week.

Producers held 2,851,212 long tons, an increase of 13,780 tons over stocks as of December 31, 1951.

On the basis of October, November and December figures, NPA estimated the industry is now producing sulfur at a rate of 5,158,180 long tons per year, slightly under the 1951 total actually made.

New Forms for Sulfur Requirements

WASHINGTON, D. C.—New reporting requirements for both consumers and suppliers of sulfuric acid and sulfur were ordered by NPA this week.

The information sought in the new forms, it was stated, is necessary to facilitate administration of the current sulfur limitations. The new procedure requires all users of over 20 short tons of sulfur in any calendar month to file a monthly report with NPA, while suppliers must file monthly reports of sales, production, imports, shipments and stocks.

Amend Wage Regulation

The Wage Stabilization Board has amended Section 3 of General Wage Regulation 21. This section deals with profit-sharing plans of the deferred-compensation type.

The amendment, unanimously approved by the Board, does these things:

1. It removes the former requirement, with respect to normal retirement at or after age 65 or retirement due to permanent and total disability, of ten years' participation in the plan; but it retains the requirement that payments must be made over at least a ten-year period.

2. With respect to benefits payable upon severance, it retains both the requirement that payments cannot begin until at least ten years after an employes' admission to the plan and the additional requirement that payments must be made over at least a ten-year period.

The requirement of prior approval by the Bureau of Internal Revenue is retained with respect to all forms of benefits covered by Section 3.

WSB amended Section 3 in this manner because investigation showed that the requirement of ten years' participation in the plan was too stringent when applied to normal retirement and permanent and total disability benefits. If this requirement had been retained most profit-sharing plans of the deferred-compensation type could not be put into effect under the self-administering provisions of Regulation 21, but would have to be submitted to the Board for approval in the form of a petition. There is nothing unstabilizing in the amendment, since the requirement that normal retirement and permanent and total disability benefits be paid over at least a ten-year period is a sufficient safeguard against possible abuse.

The text of the amended Section 3 of Regulation 21 follows:

Section 3. *Profit Sharing Plans of the Deferred Compensation Type*

Parties may, subject to the reporting and waiting-period provisions of Section 5, below, put into effect new or amended profit-sharing plans, approved by the Bureau of Internal Revenue under pertinent regulations, which provide for the payment of benefits, derived from employer contributions, upon retirement for reasons of age at or after age 65, or upon retirement due to permanent and total disability, where such payments are payable over at least a 10-year period. A plan may also provide for benefits payable upon severance provided that (1) payments under such plan do not begin until at least 10 years after an employe's admission to the plan, and (2) payments are payable over at least a 10-year period. No immediate benefit derived from employer contributions may be provided in the form of a lump sum cash or loan value except in the event of the employe's death.

More Steel for Paper Industry

WASHINGTON, D. C.—The pulp, paper and paperboard industries were awarded 5,154 tons of structural steel for industrial expansion and general commercial construction for the second quarter, 1952.

Sulfur Allocations

WASHINGTON, D. C.—Work on sulfur allocations for the third and fourth quarters of the year will begin about mid-April, the Sulfur Committee of the International Materials Conference reports. By then it is hoped to have the returns from the questionnaires circulated among the various governments on consumption and other data.

* most any product in most any industry can be made better with DOWICIDE "A"

Dowicide® A is water soluble and is, therefore, easily added to water extended adhesive solutions giving them protection from decomposition caused by mold and bacterial attacks.

Dowicide A is used effectively to disinfect contaminated walls before the application of a mold resistant paint. Water extensible paints are preserved with Dowicide A.

Dowicide A is used to disinfect buildings, egg storage rooms, and poultry feeding stations. When used in the wax emulsion coating, it protects citrus fruits from blue mold and stem-end rot.

In the paper industry, Dowicide A is used to protect paper sizing and coating solutions from mold and bacterial attack, both during use and storage.

Dowicide A protects soluble oil emulsions from bacterial decomposition and the accompanying unpleasant odors, emulsion breakdown, and the clogging of screens.

Rayon or silk thread in storage is protected against mildew by the addition of Dowicide A. It is also used to preserve protein, animal glue, casein and starch sizing solutions.

Water solutions of Dowicide A are used as disinfectants and germicides in public buildings and homes, and as a deodorant in and around garbage cans and chemical toilets.

Dowicide A prevents mold and bacterial growth during many stages of leather processing. It is also used to protect coating and finishing materials from costly bacterial attacks.

MAKE your own tests today! We believe you will find even more new uses for Dowicide A. If you are confronted with a specific problem, make use of Dow's complete laboratory facilities—write for information concerning the many different Dowicide products, including Dow's PENTA, the dependable wood preservative.

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DOW CHEMICALS

Taxes or Industry?*

Cola G. Parker

President, Kimberly-Clark Corp.

Vice-President, American Paper and Pulp Assn.

After very considerable thought about the commission I had undertaken at Mr. Tinker's request, I had the temerity to come up with a suggested title, "Taxes or Industry—Question Mark!"

The shocker might as well come at the beginning; because notwithstanding the numerous warnings voiced by experts such as Senators George and Milliken of the Senate Finance Committee and Congressmen Doughton, Reed and others of the House Ways and Means Committee that we have reached the limit as far as concerns personal and corporate income taxes, I strongly suspect that there is still a very large minority in both houses of Congress (if not a majority if it comes to a vote) and probably a majority among all the people who look upon corporations and industry as fair game; and who think taxes can continue to be raised and raised again without (to mix metaphors, if I may) killing the goose that lays the golden eggs; just bringing a few more squawks. I think the warning implied by that title is not unjustified. The squawks you hear are real.

Discussion of this subject requires the use of dull, prosaic figures. I shall try to keep them to a minimum, but some are unavoidable. So to make a start.

In fiscal 1900, with a balanced budget, Federal taxes amounted to $3.88 per capita; and there was no corporate income tax. In 1940, Federal taxes amounted to $41.00 per capita, a rate 10½ times that of 40 years before. Under the present tax laws, the tax take this coming year will be $472.00 per capita, or 122 times the rate per capita in 1900 and 12 times the rate per capita 12 years ago. And we are faced with an estimated 15 billion deficit, so that if we taxed to the full amount of proposed expenditures, the Federal tax take would be about $570.00 per capita, or 147 times the per capita rate of 1900 and almost 14 times the rate of 12 years ago. Then, as now, we were embarking on a defense program.

That, of course, isn't the whole picture. The other side of the escutcheon is that per capita income has only increased in 52 years less than 8 times in dollars and much less than that in dollars of constant value.

Those figures embody one small measure of how far we have traveled on the road to national suicide. Furthermore, the accelerating speed at which we are traveling on that road is exemplified not only by the comparison of 1900 with 1940 and 1940 with 1952, but also by that recently widely publicized analysis showing that the present administration in less than 7 years has taken from the people in taxes more in dollars than all the Federal taxes in the previous history of our country from 1789 to 1945—a span of 156 years.

It might well be pertinent here to recall those words of Abraham Lincoln in talking to the young men's lyceum at Springfield, Illinois in 1837 —115 years ago when he said:

"Shall we expect a transatlantic military giant to step the ocean and crush us at a blow? Never! All the armies of Europe, Asia and Africa combined with all the treasure of the world (our own excepted) in their military chest, with a Bonaparte for a Commander, could not by force take a drink from the Ohio or make a track on the Blue Ridge in a trial of a thousand years.*** At what point then is the approach of danger to be expected? I answer. If it ever reach us, it must spring up amongst us; it cannot come from abroad. If destruction is our lot, we must, ourselves, be its author and finisher. As a nation of free men we must live through all times or die by suicide."

And when we recall that Lenin is often quoted to the general effect that we can be most easily ruined by forcing us to spend ourselves to destruction, perhaps we may find that as the definition of Lincoln's phrase (that we can only) "die by suicide."

Probably most of you are also familiar with that famous letter of Macauley's written some 20 years after Lincoln's talk in Springfield, commenting upon our form of government and predicting its ultimate fall; saying in substance that the time would come, probably as a result of a depression, when we would embark upon a system of taxation that would ultimately wreck our government. I suspect that many of us with increasing frequency have heard speculative comment as to the accuracy of Macauley's prediction in the light, in fact plight, of our present fiscal position.

No one, I am sure, will deny that the continued existence of a civilized free world depends upon a strong American economy. Furthermore, a strong economy necessarily depends upon healthy, efficient and solvent industry. If in fact our present course jeopardizes that, then that suggestive title I have used is fully justified.

It goes without saying that our domestic problems and the political decisions we face are inextricably bound up with our entanglements in the foreign field. That doesn't mean that if we had a condition of real peace with no evil aggressor leering over the horizon, then everything would be rosy. Even if V-E and V-J Days had resulted in a real peace, we would still have had and be having our debates over the welfare state, socialized medicine, etc., etc. But perhaps Mr. Churchill wouldn't have made his recent visit and it is possible there might have been less interest in whether Eisenhower is a Republican or a Democrat. Certainly we might debate the issues without constantly glancing over our shoulders to see if "Uncle Joe" is making a new hostile move.

But of course the international situation is not part of my subject and I shall try to make only such passing references to it as may be necesary in discussing our fiscal situation. That may not be too easy when considering spending and taxes, resulting largely from global commitments, which threaten to wreck what is almost the only remaining solvent major economy in the world. I hasten, of course, to except our good neighbor to the north, (whose example we might emulate with benefit to ourselves) for when last I saw her figures, she had a surplus of several hundred millions in only a little more than half of her current fiscal year, while

* Presented at the Open Meeting of the American Paper and Pulp Assn., New York, N. Y., February 22, 1952.

we have a deficit approaching $8 billion.

But to assess our current picture, I think at least a cursory look at pre-Korea is necessary. And these remarks appear to me to be valid whether or not we arrive at an armistice or even an uneasy peace in Korea. For that is a pretty small segment of the world *except* in terms of casualties.

As we entered the second half of this century, we found ourselves, after being victorious in two World Wars within a generation, face to face with the fact that we were not at peace. More than that, the fact was that whether we could achieve peace was not within our power to determine. And whether the short-run future was to be one of a general and continued cold war or was to blaze up into the greatest holocaust the world had ever seen, was quite beyond prediction having any certainty.

Now we are embarked upon a mobilization which eventually must be complete, unless something no one has yet suggested or can foresee changes Russia's course.

As we neared the beginning of our last fiscal year, we in this country were approaching a fiscal crisis; realized by all too few. We were operating in the red by something over 3 billion dollars, our budget for fiscal '51 was equally unbalanced and pressures, mostly political, for more spending, were mounting.

The administration, under the Reorganization Act had moved to establish a Department of Welfare and had only been stopped by Congressional disapproval. Repeated recommendations had gone to Congress for more spending, for aid to education, an F.E.P.C., for the beginning of socialized medicine, for Valley authorities, etc., and Congress shortly passed an enlarged and more costly social security bill.

All of us were largely disregarding the voices of the relatively few Cassandras warning us of the ultimate end of the primrose path we as a nation were treading; and there was no answer to the question one Congressman asked as each spending bill came up, "Where are you going to get the money?" Mayhap we, like the donkey reaching for the wisp of hay, which ever receded in front of him, have been blindly following the will of the wisp of just a little inflation until we, as have many before us, have been lulled to insensitivity and do not realize its effects. And then came Korea, the bill for which we haven't yet seen except in the form of more than 105,000 casualties, with probably at least 20,000 of them dead, in view of the more recent news as to the Communist action with their prisoners.

Congress adjourned last fall after passing appropriations aggregating over 91 billion and with 3 tax bills in 10 months, our tax take is estimated to reach over 71 billion next year. That, if you will recall, is almost 25 billion more than our highest tax taken during World War II.

That is not all.

So-called defense spending alone is to move from 45 to 55 to 65 or 70 billion in a 3-year space—on the assumption that Korea will be settled (presumably saving face for the Communists) and no other similar "police action" will occur.

Officially we are told that total spending, Federal alone, will reach 86 billion in the next fiscal year. If my recollection serves, that is only about 15 billion below the peak of World War II and is only 5 billion below the average of the three peak years of World War II; and is based on our *not* being at war.

What do these things mean?

Is it not clear that we must face a drain on our substance, men, materials, and money, exceeding any that we have ever thought we could stand? A tax bill for an equal number of years far beyond the total of World War II a commitment again of our young men to military uses—and that means all of them (not just some), unless we reverse the verdict of all history which denies the possibility of a partial mobilization. And remember, too, that Congress is committed by its own act to pass upon a universal military training bill which the House Committee has voted and action must be taken in less than 60 days.

You and I know when we read about the index of industrial production and its feverish pulse, that regardless of higher wages or mass total income or national product, production for war or defense is not the creation of wealth for the betterment of the condition of men. It is, to the contrary, the wastage of men's time that can never be recalled and materials that are irreplaceable by devoting them to destruction instead of constructive ends.

It is in that setting that we face this year's Federal tax bill of $71 billions and to that must be added $20 billions or more of state and local taxes which will bring the per capita burden to $600. So we are talking about $2,000 or so per family, per year.

Beyond all this, we must not forget that with our debt at an all-time high, our need to borrow up to 15 billion more in the next fiscal year will bring the debt to at least $270 billion, with our statutory debt ceiling set at $275 billion. It does not need a cynical historian examining our actions of the past 20 years to predict that there is every likelihood that once more we will raise the ceiling.

I shan't attempt to recite the pros and cons of the argument as to how high a debt we can stand; nor to attempt to assess their validity or force.

But there is definitely the corollary question, "How high can taxes go?"

According to present projections, our Federal tax take will exceed 25 percent of the national income and when all state and local taxes are added, the take approaches, if not exceeds, ⅓ of the national income. The general economic view is that anything beyond 25 percent is risky and at least one well-known economist has cited numerous instances of countries which have started down-hill when that point was passed in their taxing structure. More than that, we have before us the example of England with its taxes of more than 40 percent of its total income and you are as familiar as I with the stories of industrial inefficiency, labor absenteeism, refusal to work after earning a certain amount because the government takes most of the increment, etc.

The time has gone by when it is possible to absorb ever increasing costs through the medium of soaking the rich. Roswell Magill, once Under-Secretary of the Treasury, has pointed out that should the government confiscate all incomes above the $4,000 bracket, the result would be less than enough to operate our inflated Federal establishment for two months.

Of course, corporation taxes have long since passed that 25 percent rate as related to income before taxes. But a more pertinent relationship might be that of taxes to net sales. A comparison of a group of companies in our industry shows that Federal income taxes in 1929 were just over 2 percent of net sales. In 1939 these were almost the same — 2.1 percent. By 1944-45 — the war peak — they reached 5.3 percent of net sales. But currently they are running almost 10 percent of net sales and of course more than 60 percent of income before taxes; and in some individual instances they are more than 12 percent of net sales and almost 70 percent of earnings before taxes. These figures do not take account of all other types of taxes such as real estate and personal property taxes, franchises, licenses, etc., which would bring the total for the group well over the 10 percent of net sales.

In the face of these conditions and notwithstanding the necessity for a strong industrial and business economy and with the apparent necessity for increasing military expenditures, the administration in its budget continues to demand vast new programs costing billions of dollars. How much, I cannot say. But they cover all those fields I mentioned earlier — national health insurance, Federal aid to education, a school construction program in defense areas, doctor training programs at Federal cost, flood control, electrification, Valley authorities, increased social security, etc.

And, of course, with such demands for further spending it was inevitable that there would be a demand for further taxes. Where will we get the money?

It seems to me perfectly obvious that

look to the leader

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SIZING MATERIALS AND CHEMICALS FOR PAPER

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PP52-2

we have long since passed the Stop, Look and Listen sign.

Now, what are the effects of these policies and actions which I have outlined? *I am attempting to stick to facts without argument as to their relative weight.*

One of those facts is that of the money that has been and is being taken from the people, some $68 billions has gone abroad for grants and loans — 1940-1950 — and of that, 57.6 billions were grants and 10.4 billions loans. These sums have, of course, been used largely to finance the export of goods—no longer then available for our own consumption. To speak merely in general terms, this has affected our ability to spend for instance on roads and education. In terms of buying power we are spending less on roads than we did in 1939-1941, although the number of vehicles on the roads and vehicle travel have increased by 50 percent.

With the increase in population, an even greater crisis faces us in our edutional plant. (I think all of us agree that a right arm of American industry is the American school system.)

The Federal Government has so completely occupied possible tax fields that the states and localities are unable to maintain the school systems and hence the continued pressure for Federal funds for education. These are merely examples of collateral effects, and I am not here arguing the relative merits of specific needs. What we here at the moment are primarily interested in is the effect on industry and our own in particular. Since I see no marked differences between our industry and others in this particular respect (with the exception perhaps of oil), I shall not attempt to differentiate our industry from others but speak in general terms.

First of all, it should be perfectly apparent that the tremendous increase in taxes has had a major effect in raising prices. *Many people think* that corporate income taxes are taxes upon the stockholders and fall on a relatively small group. Practical business operators know that isn't so, except perhaps for limited periods or under artificial controls. Corporate taxes are just as much an element of cost as raw materials or labor. They are usually included in the price of the output and are ultimately paid by the final consumer.

This must be so because a corporation must make a profit if it is to survive; that must be profit *after* taxes and we all know that. Without profit an enterprise can neither get nor retain capital and must fall by the wayside.

Another thing we all know and that is that when too high costs of whatever nature force prices too high, customers evaporate and there is neither job nor profit left. That too high taxes have played their part in getting Britain's export prices too high to permit her to compete in world markets in many instances seems to me clear beyond question. That we may be approaching such a level is a very serious question facing all industry, which includes our own.

Earlier I mentioned that we have had 3 tax bills in 10 months. They have resulted in a 30 percent increase in individual income taxes and a 60 percent increase in corporate taxes. The corporate tax rate, which was 40 percent in World War II, is now 52 percent—and the excess profits tax is even worse, for it starts with the dishonest presumption that only 83 percent of profits in the base period were normal and then assesses a rate of 82 percent on all the excess.

This latter tax falls most unevenly. It results in virtual confiscation of most of the returns properly to be expected from those expansions, rebuildings and new capacity which were completed either late in the base period or thereafter. That it dulls, if not eliminates, the incentive to expand should be quite clear from the government's own action in granting certificates for accelerated amortization of new capacities deemed essential to the defense effort.

I skip lightly over the fact that in periods of inflation, depreciation allowances are totally inadequate to provide replacement of worn out facilities. I shall merely mention also that in such periods of inflation, so-called profits subject to tax are tremendously inflated by inventory profits, which are not profits at all, cannot be either distributed or put into plant replacement or expansion because already invested in the necessary inventory, but are nevertheless taxed as a profit. As a result, there is even less left of true profits either to be paid as dividends or retained to strengthen the business.

But both of these are extremely important considerations; for the records show that industry has grown and strengthened itself largely through retained profits.

So while retained profits as stated on a large number of balance sheets look to be huge, they are vastly overstated in the sense that very large amounts merely make up for inadequate depreciation allowed under the tax laws in a period of inflation because based on historic cost and therefore insufficient to equal replacement costs.

Many, if not most, corporations are effectively limited in their capital expenditures to the funds they can set aside from operations. When the government becomes, as it is today with a 52 percent rate and an excess profits tax, the recipient of more than half, and probably over-all 60 percent of profits before taxes, the long-run effect is certain to be seriously damaging to our production capacity. It will not show up in a year or two, for most of our machinery can be operated until, like the one horse shay, it just falls apart. *But it will happen in time unless we can retain enough of our income to permit us to adopt the improving technology so necessary to a dynamic economy.*

One of the most disturbing aspects of present tax rates is their tendency to cause a freezing of the business pattern, if, in fact, they do not actually fall with greater effect on small than on large enterprises. We need the industry and ingenuity of small business. Regardless of high mortality rate even under normal circumstances, they create new jobs and more production. They continually challenge their older competitors and keep them on their toes. Continued high taxation will end this.

Many more evil effects of our present corporate tax structure might be cited. For instance, the tendency to be lax on costs; "Why worry, it comes out of the excess profits tax." Anyone charged with running a business must be fully familiar with difficulty of *adequately emphasizing the importance of the 18% retained as against the 82% confiscated by the government.*

But as I have tried to indicate, I think the most serious result of the high rates is its *adverse effect on capital formation—the life blood of an expanding economy.*

Almost 4 years ago the London Economist had this to say:

"It is all too easy for a democratic universal suffrage community to allow capital formation to be pushed to the wall. Capital creation may be necessary but there are few votes in it. Yet the penalties for neglecting it*** will in the end be inexorable. An installment is being experienced now. But if under-investment continues much longer, then it may be wholly impossible to rescue the British economy."

But I have talked too long and I shall close.

Many people now believe that we have a depression-proof economy. I suspect if we continue on our present path, they have a surprise in store for them. But I am not here to predict a depression, or its timing, or its depth.

Since the continued existence of a civilized, free world depends on a strong America, what should we do to assure that we remain free and economically strong?

Unfortunately for our thinking that we are relatively free, the answers lie largely in the realm of government action. What *we* must do *as individuals* is to understand what must be done and *then see* that we have a government that will do it.

Peace should be a stimulant and not a depressive. Peace must be our first objective.

A possible further program involves these points as well:

1. Reduce non-defense spending in at least the measures that Senator Byrd has fought so hard to achieve, and also cut out the frills and furbelows and waste in defense outlays.

2. Require that government declare now—and take action toward its accomplishment — to return to sound money, balanced budgets, reduced fiscal exposure due to short-term floating debt and contingent liabilities based on debt guarantees, and make the Federal Reserve Board really independent with no responsibility for support of the bond market. (That won't suit Patman.)

3. Announce now — and provide in any way possible as well—intention to reduce taxes as soon as defense expenditures decline and avoid any temptation to adopt new spending programs.

4. When action is taken as to controls on prices, consumption, and investment which are due to expire next June, assure that they are dropped at the earliest opportunity. Some, in fact, could be dropped now.

5. Endeavor to secure labor support for programs for increased productivity instead of wage inflation, so that where there is increased productivity, wage increases then made can be real and not illusory.

6. And, of course, business and industry must contribute its share of sound action. It must stop hysterical, scare buying and selling; it must reduce its inventories to normal or even tight proportions, stopping the hoarding of scarce or critical materials and manpower; cut out its own deadwood, and increase its efficiency to the maximum; and at the same time reduce its debt and get its own financial house in order to the maximum degree permitted by the tax burdens it bears. That, of course, is no small order, but —I suggest that action of this sort in an atmosphere of peace will fairly start us on the road where we can at least minimize the fears that drive us now like one possessed.

In closing, I would ask you to understand that—however emphatic and completely confident these comments, questions, and suggestions may sound, I do not pretend to have all of the answers. I approach these problems with a knowledge of inherent prejudices that all of us have in some degree or other, but with a determined attempt to be as objective as I am capable of being. At the same time, *I have a belief that all of us in our various walks of life have today more urgently than ever before, the obligation to observe what is happening, to think about and discuss events, their courses and their results, and to arrive at the soundest judgments of which we are capable in times when that is more difficult to do than ever before.*

If we do not, we may find ourselves asking the same question as an English professor, "Is it conceivable that the American people, having provided so strong a proof of the virtues of a free economy, are gradually becoming unaware of, or indifferent to, the secrets of their own greatness?"

Our security as a nation depends on all of our personal efforts; for our total effort is the sum of our individual efforts.

False pretense, chicanery and outright deceit have taken power in much of the world. To some extent we have them here. Let us cast them out; let us recapture our morality; let us demonstrate to the world the virtues of that freedom which has made us great.

Selected Abstracts of Papers Presented Before Annual Meeting of TAPPI

Continued from February 29, 1952 issue of Paper Trade Journal

MECHANICAL CORRECTION OF TWO-SIDEDNESS

M. J. Landberge, P. R. Schreiber, and H. H. Behrens

The primary causes of two-sidedness are given as heterogeneity of fiber furnish, fillers, and coloring matters.

Structural two-sidedness caused by unequal length and density of fibers is almost impossible to correct since the fines are removed from the wire side in preference to the long fibers. Two-sidedness due to fillers is closely allied to the structural type but is more readily balanced by replacement of filler at the guide roll, size press or at a coating unit. Duplexity due to color is probably the easiest type to correct.

In heavily loaded sheets proper choice of dyestuffs and pigments to color the filler and fiber in balance may yield even-sided sheets. On the other hand, sheets with little or no filler content cannot be controlled in this manner. The means of correction recommended here is that of staining the wire side of the sheet at the size press with some attenion given to coloring at the guide roll.

Various installations in use in the United States and Canada are discussed. In general, the equipment which is simplest from the engineering standpoint requires most manual control. If more attenion is given to the details of construction and of equipment less dependence is placed on the machine crew or colorman for keeping both sides of the sheet in balance. Seven schematic diagrams are shown to illustrate these statements.

THE BEATAPULPER

Arthur W. Infanger

The best features of the Cowles Knifemill, which is now in the final development stage, and the Cowles Side Drive Pulper (now called the Aquapulper) have been combined in one unit. The Beatapulper, which efficiently performs the functions of pulper, beater and refiner. The unit can be furnished like a pulper, and the stock is slushed, defibered, refined, hydrated and shortened as desired before dumping. The Beatapulper is normally operated on a batch cycle and size, color, alum, or other chemicals can be added in the pulper. The pressure between the rotating knives and the moveable refining ring is adjusted by means of three hydraulic cylinders. A relatively light pressure gives a good brushing action on the fibers and results in considerable strength development.

A comparison of results obtained with the Beatapulper and a standard commercial refiner, using 100 percent bleached Tacoma kraft furnish in 68° F. water at 4½° percent, gives the following values at the end of the runs. (22 hp. per ton per day)

	Percent Bursting strength	C. S. freeness	Percent Tear
Beatapulper	106	475	258
Refiner	66	182	115

The complete curves show many interesting characteristics, and it is pointed out that the Beatapulper power figures include the pulping power, whereas the pulping power must be added to the refiner power figures.

Performance curves and operating characteristics are discussed for various furnishes now being processed in a Beatapulper in actual mill operation. This Beatapulper is of the 10 SD8 size, operates on a batch cycle holding 2000 pounds of 5 percent furnish.

HANDLING MATERIALS IN THE PAPER INDUSTRY

L. O. Millard

The problem of materials handling in all industry is a challenge to the en-

gineering profession, and certainly the pulp and paper industry with its approximate annual production of 24,000,000 tons of paper is one of the nation's most important.

The importance of materials handling equipment in the paper industry is further emphasized by the fact that, for every carload of paper shipped from a mill, at least four carloads of pulpwood, chemicals, coal, and other materials must be processed. In these trying days of inflation, price controls, and the high cost and shortage of both labor and materials, mechanization of materials handling operations is of prime importance.

Physical handling of materials, whether it be manual or mechanical, adds cost only. It is a necessary evil that adds absolutely nothing of marketable value. Therefore it is not surprising that mechanization of one mill's wood room, for example, resulted in an estimated saving of $100,000 annually. Shifts were reduced from three to two, wood saving was accomplished through greater wood utilization, and there was a reduction in maintenance.

Both new and modernized, large and small pulp mills throughout the north, south, east and west, will be shown to illustrate the application of materials handling equipment and the part it is playing in reducing costs in the production of paper—from receipt of raw materials to the shipping room.

THE HAMMERMILL DIRT SEPARATOR

E. L. Rastatter and A. H. Croup

The development of a centrifugal-type cleaning device for pulp and paper furnishes is described. This separator was designed specifically for the removal of small, low specific gravity speck dirt. Details of the developmental procedure are given. Very good efficiency in the removal of impurities of both wood and non-wood origin is indicated. Long, slender shives are not effectively removed. The details of a small installation in operation for over ten years are given and the plans for a commercial design based on the use of these units are described.

PILOT PLANT RECOVERY OF HEAT AND SULPHUR FROM SPENT AMMONIA-BASE SULPHITE PULPING LIQUOR

J. H. Hull and G. V. Palmrose

Operation of a pilot plant at the Lebanon, Ore. mill of the Crown Zellerbach Corp. for studying evaporation and burning of ammonia-base spent liquor with recovery of sulphur from the resultant flue gases has demonstrated the practicability of the process.

The pilot plant took the liquor from 10 tons of pulp per 24 hours, concentrated it from 9 to 50 percent solids and burned it under a boiler. Sulphur dioxide was recovered from the flue gases by scrubbing them with ammonia solution. The resultant ammonium sulphite-bisulphite solution was returned to the mill acid plant for addition to the raw acid.

The evaporator was a single effect Conkey flat plate heating surface type with 2200 square feet of heating surface. It had no condenser and was operated as a falling film evaporator. Two circulating pumps were supplied for employing the Rosenblad channel switching system for control of scaling.

Continuous circulation of condensate over the plates with channel switching every 8 hours gave adequate control of scaling. This was true even though the condensate contained no acids. In a multiple effect evaporator where the condensate contains some acids this method should be even more effective.

No trouble with polymerization of the liquor was encountered.

The burning work indicated that for good combustion a refractory furnace ahead of the boiler should be employed. However, conversion of a hogged fuel fired boiler involves only the removal of the grates from the dutch oven and the addition of some duct work and brickwork.

Steam production was well over 10,000 pounds per ton of pulp.

Burning liquor from salt water borne logs increased the fouling rate of the boiler tubes and gave a sticky deposit on them.

The absorption system consisted of a direct contact cooling tower and an absorption tower. Both were packed with 3-inch spiral tile.

Useful sulphur recovery varied from 100 to 125 pounds per ton of pulp.

Sulphur as sulphates varied from 5 to 9 pounds of sulphur per ton of pulp.

Only a trace of ammonia was found in the cooling tower effluent.

Severe corrosion was encountered in the cooling tower system when operating on liquor from salt water borne logs. This was due to the formation of hydrochloric acid from the salt carried over into the tower.

In general very little process trouble was encountered. The conversion of a mill to the ammonia-base process should be relatively inexpensive since the furnace is relatively simple and the absorption system requires no extremely high towers. Equipment is on order at present to provide full scale evaporation and burning at Lebanon.

SULPHATE FORMATION AND ITS EFFECTS ON SULPHUR USAGE

George Knight and M. S. Anderson

Recent developments in the recovery of waste liquors and methods of steaming and circulating the digesters, combined with the present sulphur shortage, have increased the importance of sulphate formation in sulphite pulping.

A series of mill trials were made to determine the effect of dolomitic lime, sequestering agents, increased free sulphur dioxide concentration, and the elimination of external steam injection devices on sulphate formation. Of these, the use of bottom digester steaming instead of steaming through the circulating systems, proved most satisfactory.

In this mill, operating on calcium base liquors made from kraft sludge, sulphur losses due to sulphate formation were found to be approximately 44 pounds per ton of bleached pulp. Technical studies showed that, in this mill, about 80 percent of the sulphate formation occurs in the digester, principally due to the presence of colloidal sulphur and air.

The validity of the results obtained while operating on calcium base has been confirmed by conversion to sodium base where a predicted reduction in sulphate formation of approximately 65 percent was obtained.

MODERN DEVELOPMENTS IN WELDED BARKING DRUM DESIGN

George M. Dick

The removal of bark from pulp wood by means of drum barkers continues to be the most economical of all barking processes for normal size logs, and barking drum design, therefore, continues to be of considerable interest to the majority of pulp and paper manufacturers. The wide variety of ideas underlying this design is an interesting study.

Originally, most of the barking drums manufactured were of riveted construction of combined rivetted and welded construction. Rivetting techniques being then of a highly developed nature and used in a variety of pulp and paper apparatus permitted repairs to rivetted barking drums to be easily made. The gradual swing to welding for pulp and paper equipment made rivetting less desirable and welding much more acceptable.

The various welding supply manufacturers as well as the welding societies and such other organizations have done much in recent years to provide improved welding materials and techniques. Early attempts to weld barking drums were only partially successful, and eventually a complete analysis of the underlying principles was made in an endeavor to establish the factors which would contribute to successful all welded barking drum design.

By enlarging the field of study sufficiently, the benefits of welding experienced in other forms of welded structures was included and, eventually a number of definite factors established as guides in welded barking drum design.

The inclusion of these basic fundamentals in a modern design of all welded barking drum is interesting and

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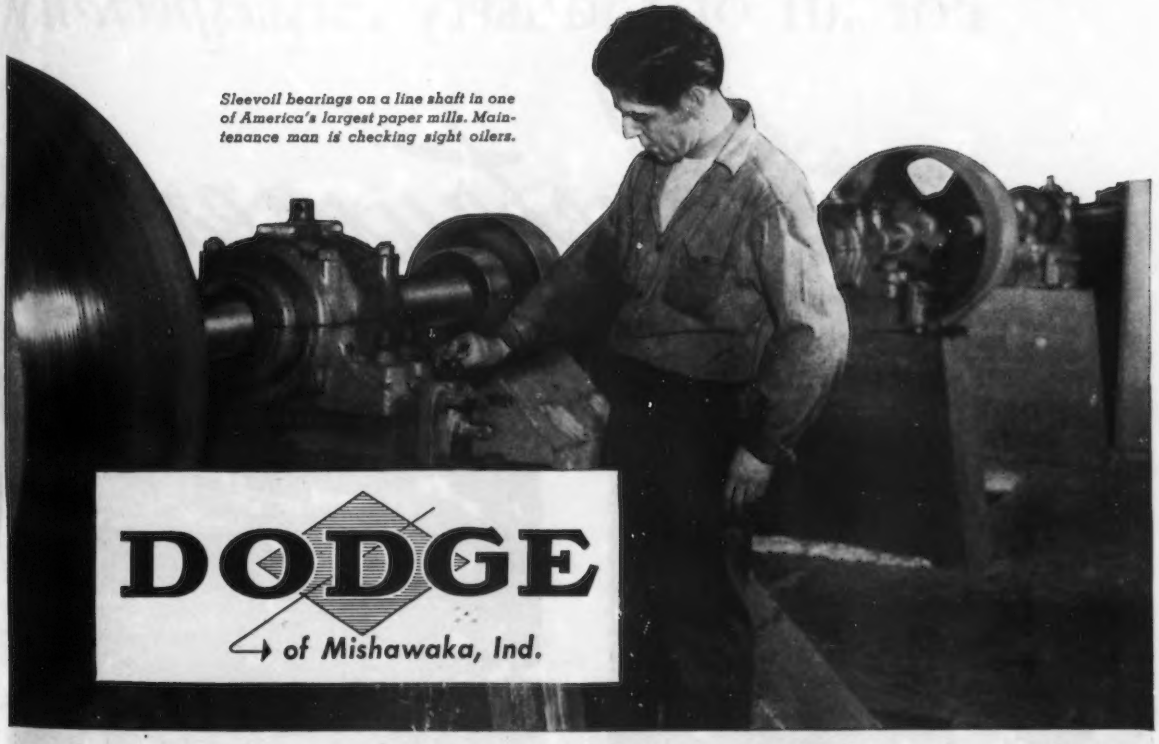

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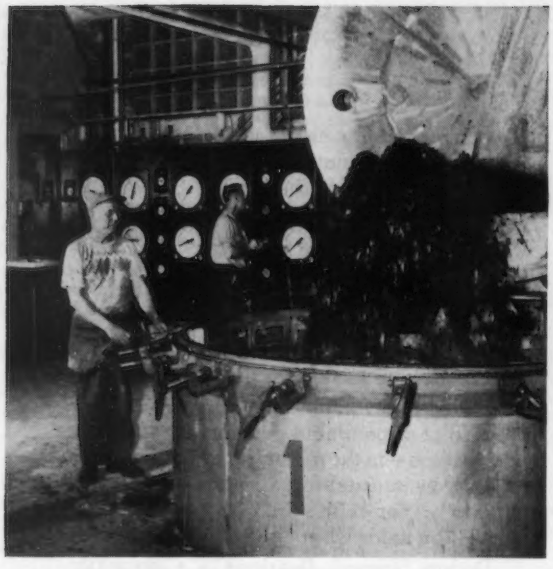

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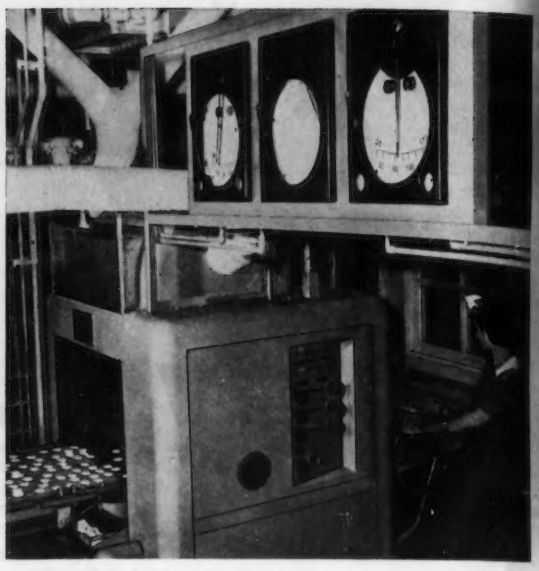

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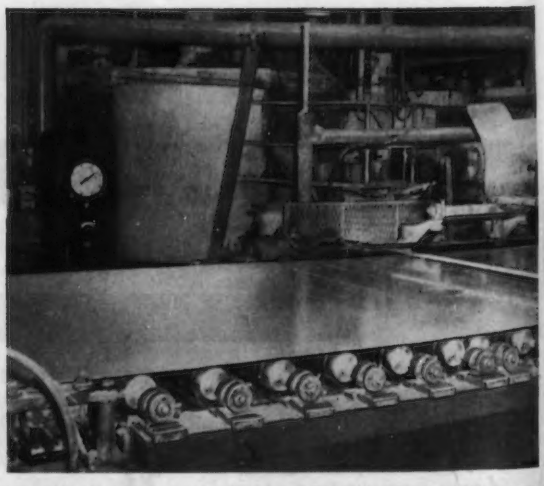

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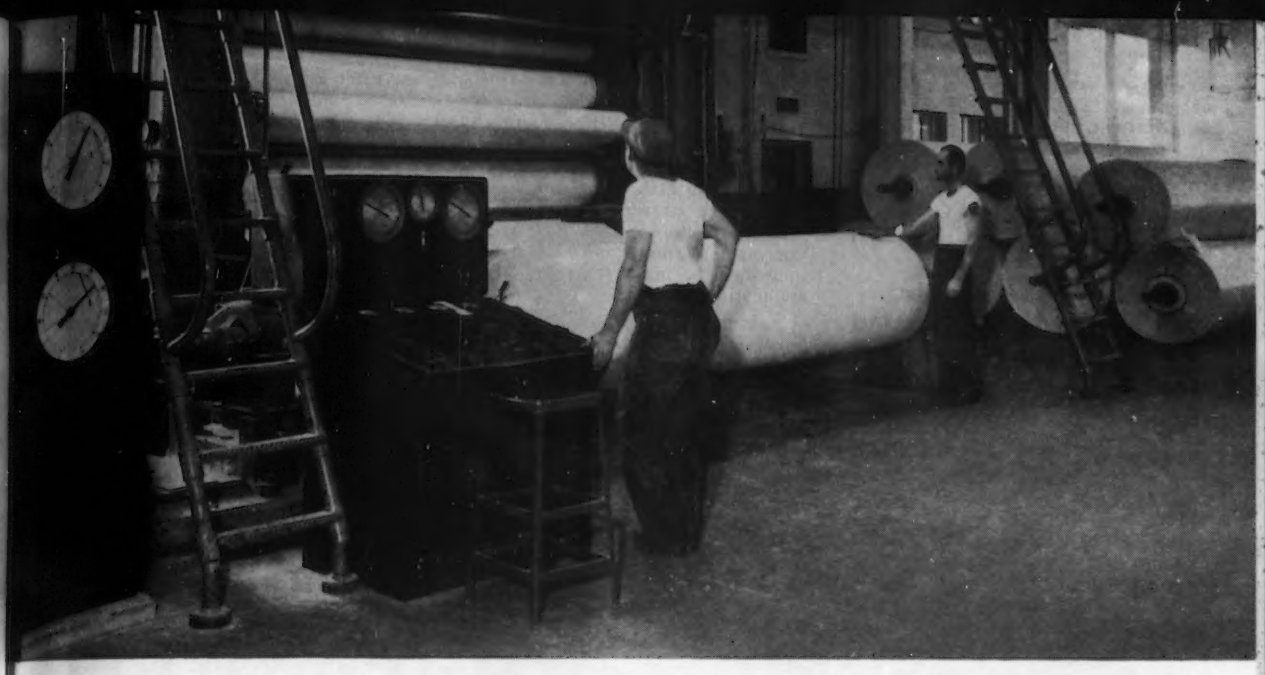

FINAL CHECK *is made on production quality . . . as ElectroniK instruments indicate and record paper speed and gloss as the sheet leaves the super calender.*

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shows how maintenance costs which are a vital factor in barking expense are likely to be greatly reduced with the introduction of this latest form of barking drum construction.

DYE ADSORPTION ON WOOD PULP. I. ADOPTION OF DIRECT DYE ON UNBEATEN SULPHITE PULP

J. W. Beamesderfer, E. F. Thode, A. J. Chase and R. E. Hubbard, Jr.

In an attempt to develop a simple and rapid method for the evaluation of the specific external surface of pulp fibers, a study was made of the adsorption of a direct dye on fibers from dilute aqueous solutions. Isotherms at 25° C., for the adsorption of Benzo Fast Scarlet on unbeaten fibers from bleached sulphite pulp, are presented. Specific adsorption of dye (milligrams of dye adsorbed per gram of dry pulp) was plotted as a function of final dye concentration and isotherms of the Langmuir type were obtained. From a knowledge of the saturation value in the adsorption process, as determined from the isotherm, and from a knowledge of the area of the dye molecule presented for adsorption, calculation of an "apparent" area of the fibers is possible.

An attempt was made to separate the process of adsorption on the external surface of the fibers from the slower process of diffusion of dye into the microscopic and submicroscopic pores and crevasses. Results are presented on experiments designed to give information concerning the effect of electrolyte concentration.

A comparison of apparent specific surface of fibers obtained by this dye adsorption method with areas obtained by the well known silvering and liquid permeability methods is presented.

THE IGNITION TEMPERATURE OF CERTAIN PULPS AND OTHER WOOD COMPONENTS

M. A. Buchanan

Sulphite and kraft pulps have an ignition temperature of about 260° C. as determined by a method utilizing a relatively short heating time. The ignition temperature of groundwood and semichemical pulps and wood is in the range of 210 to 230° C. The difference is due to lignin and hemicelluloses, both of which appear to have an ignition temperature of about 180° C.

THE MANUFACTURE AND PROPERTIES OF CHLORINE DIOXIDE

E. Kesting

Commercial interest in chlorine dioxide has greatly increased since the last war, and it is now particularly the wood pulp industry which is concerned with its manufacture and application.

Although it is a chemical of considerable latent energy, which is ready to initiate explosive reactions with almost any combustible or oxidizable matter, safe and efficient ways have been found for its manufacture and handling. The problem of transporting it in compressed or liquid state has, however, not yet been solved and it is necessary, therefore, to make it at the place of application.

Sodium chlorite is available for this purpose but the rather circuitous steps involved in this procedure lead to high costs and restrict its use severely.

Other industrial procedures now carried out at various mills were founded on the use of solid sodium chlorate and its conversion first into chloric acid and the reduction of the latter to chlorine dioxide by various agents. The basic intention in each case is to obtain in one step or in a series of simultaneous steps a maximum yield of chlorine dioxide from the expensive chlorate as the accruing waste products prohibit the re-use of the exhausted liquor. Much stress is also put on making the dioxide as free of chlorine as possible. Due to the ease with which both can be separated, these efforts seem rather pointless.

The Kesting process, which has already produced several hundred tons of chlorine dioxide, follows a different pattern. It makes chlorine dioxide from hydrochloric acid, water and electric current. The carrier for the oxygen needed in the oxidation of the hydrochloric acid is a solution of sodium chlorate, which continuously circulates between the dioxide reactor and an electrolytic cell for fortification. No sodium chlorate and no sodium chloride—the initial charge excepted—need to be purchased and there are no waste products. The process is continuous and exceptionally well suited for automatic control. The cost of the chlorine dioxide thus produced closely approaches that of hypochlorite chlorine, both measured on active basis.

EFFECT OF VARYING COMPOSITIONS OF SILICATE ON CORRUGATOR OPERATION

J. G. Lander

Silicate of soda is a compound of silica (SiO_2) and sodium oxide (Na_2O) in aqueous solution. The ratio or proportion of sodium oxide to silica, and the specific gravity or Baume of the solution are critical factors in tailoring silicate to the job of efficient corrugator performance. The ratio range has over the years narrowed down to $1Na_2O:3.22\ SiO_2$. Generally speaking the higher silica ratios produce faster setting; low silica ratios produce slower setting.

Specific gravity or Baume covers a wider range, and because it denotes concentration of solution it is very critical and must be adjusted to the operation, particularly with the high silica ratio silicates.

In choosing optimum specific gravity or Baume careful consideration must be given to: (1) type and condition of equipment, (2) geographic location, (3) steam pressure available, (4) kinds of linerboard and corrugating mediums used, (5) prevailing types of corrugated board produced, (6) standard of quality to be met, (7) possible machine improvements and adjustments.

Silicate manufacturers hold the production of their various grades of silicate of soda under close control and use utmost care to deliver same to exact specifications, thereby freeing the box maker of the problem of adhesive control.

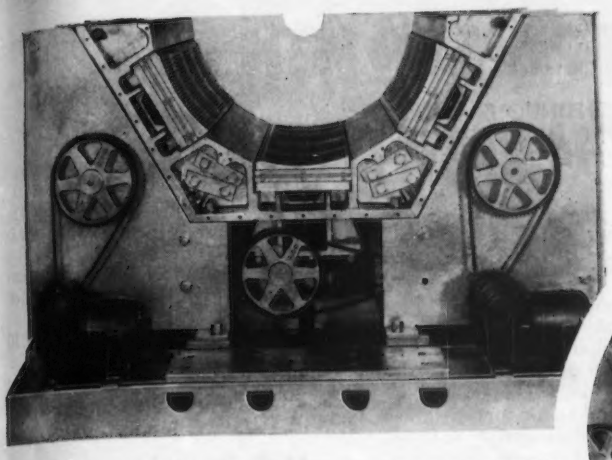
A METHOD OF LABORATORY EVALUATION OF CHEMICALS AS POTENTIAL SLIMICIDES

S. I. Cohen and Marcine Kahm

In the initial screening of chemicals as potential slimicides frequent variability of antiseptic data has been encountered from test to test. Using standard methods, it is often impossible in our laboratory to distinguish between such variability and any intrinsic toxicity associated with the chemical structure of similar compounds. This was found to be especially true for mecurials. To reduce this variation, the standard Petri plate method of Appling and McCoy was modified to improve the accuracy of several steps by (1) standardization of inoculum to 1 million organisms per c.c., (2) through mixing of chemical and melted agar in test tubes before pouring plates, (3) addition of inoculum to cooled, melted agar instead of surface streaking, (4) extremely accurate dilutions of the chemical. In spite of these modifications, no significant improvement occurred in accuracy and reproducibility. This suggested that the type of medium is an important factor.

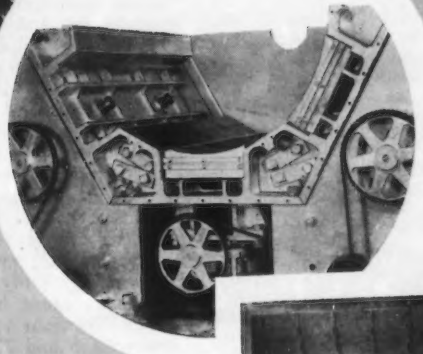
A synthetic liquid medium was adopted and used in a test tube technic. One milliliter of a dilution-series of the chemical is added to 9 ml. of the medium, followed by 0.1 ml. of inoculum. The tubes are agitated by hand at fixed intervals or continuously on a shake-table. After 24 and 48 hours of incubation, turbidimetric measurements are made yielding germistatic data. Information about germicidal action and killing-time are obtained by combining the chemical dilutions with the inoculum for arbitrary time intervals before loop transfers are made to media tubes. The latter procedure also permits evaluation of chemicals that can not be added directly to the synthetic medium.

The above technic has proven reproible and accurate at least to 7.7 percent with compounds that could not be assayed with the plate method. Three bacteria and one fungus were employed satisfactorily as screening organisms to date. The new method offers the



Bed plates in position.

One plate removed to show adjusting push rods. Each plate adjusted separately, with extreme precision.



Showing guide vanes in hood to force entering stock to travel spirally across beater during beating cycle.

THE *Flexibility* OF THE NEW MIDWEST-SMITH BEATER

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The stock enters on one side under pressure and after a 1 to 3 minute beating cycle discharges on the opposite side. The stock does not immediately spread across the entire face of the roll and bed plates as might be expected. Instead, its path of travel is controlled by spirally positioned vanes in the hood and some eight separate and distinct trips between the roll and bed plates take place as the stock gradually moves from the inlet side to the discharge side.

Each of the three bed plates is separately adjustable to the roll—the hydrating and brushing area is four to eight times that of a disc or conical refiner or jordan, and the desired treatment is definitely predetermined and controlled.

Mills running Kraft or semi-chemical pulps—all mills, in fact, should be very much interested in its economy of operation. There is no stock circulation by the roll and there is no bar to bar contact between roll and plates. Consequently, the motor required to drive an average size jordan will drive a Midwest-Smith.

The absence of bar to bar contact means almost indefinite service from one set of roll bars or one set of bed plates. This is in itself a major economy.

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possibility of developing dosage-response data for interpreting the dynamic relations between microorganisms and antiseptics.

PERFORMANCE OF PAPER MACHINE WET FELTS. II. FURTHER STUDIES OF THE PLUGGING OF FELTS

D. W. French, C. M. Christensen, and S. J. Buckman

The wet felts of paper making machines may become plugged or occluded by deposits which accumulate on and adhere to the wool fibers. This often occurs before mechanical wear or microbiological deterioration have much affected felt performance, although it may be associated with some aspects of microbiological activity within the felts.

To determine the degree to which various felts were plugged, the following technics were used: (1) samples of felt were embedded in plastic, sectioned with a microtome, the sections stained and examined microscopically; (2) the amount of time required for a given amount of water to pass through a sample of felt under standardized conditions was determined; (3) the amount of water absorbed by a felt sample of standard size, and the amount retained after passing the wet sample through a wringer under constant pressure were measured. A combination of these methods gives more accurate information than any one of them alone.

A number of technics were devised to determine the nature and composition of the material causing plugging: (1) plugged felts were extracted with various solvents to obtain resins and similar materials; (2) felt samples were washed to determine mineral content; (3) samples were blendorized in a Waring blendor to remove deposits from the fibers. These were subsequently separated, and the deposits subjected to various tests to determine their nature. As a result of these tests it was found that the material causing the plugging might consist mainly of resins, mainly of filler material or mainly of fragments of scales from the outside of the wool fibers. In many felts, the plugging material was a composite of different substances, with considerable variation in makeup from mill to mill according to the type of pulp processed and the kind of paper produced.

Various attempts were made to determine the role played by bacteria in the plugging of felts. These involved culturing of plugged material to determine the number and kinds of bacteria in it, partition chromatography of new and used felts in an attempt to detect bacterial by-products as well as degradation products of the felts, and the inoculation of felt samples with bacteria. It seems unlikely that aggregations of bacteria are solely responsible for large amounts of plugging, but the presence of bacteria may increase the amount of plugging caused by other materials.

STUDIES IN CONTINUOUS ALKALINE PULPING. II. HIGH ALPHA-CELLULOSE PULPS FROM SCRUB OAK

W. J. Nolan and W. F. Brown

Further data are presented on the Florida continuous process, involving presteaming and shredding of chips followed by pulping at substantially constant concentration and temperature. The effects of wide ranges of steam pressure and liquor concentration on yield and chemical analysis of oak pulps are tabulated.

A definite relationship between pentosan content of pulps and liquor concentration has been found. Percent pentosan can be regulated from 9 to 11 percent at 20 g.p.l. to 2 to 3 percent at 80 g.p.l. Only minor changes in pentosan content have been observed due to variations in cooking pressures between 115 and 170 p.s.i.g. or variations in cooking time between 10 and 30 minutes. Under presteaming conditions thus far used prior to shredding, the upper limit for pentosan content seems to be in the neighborhood of 12 to 13 percent instead of the 20 to 22 percent realized in batch pulping of untreated chips. This is due to the fact that about 23 percent of the pentosan in the chip is removed by steaming, possibly due to acidity in the center of the chip in spite of the alkaline steaming liquor.

Yield, lignin and alpha-cellulose content may be very closely controlled by steam pressure, liquor concentration, and time. For example, a pulp of 44 percent yield and 2.0 percent lignin content can be produced in 10 minutes time of contact with liquor of 35 g.p.l. with a steam pressure of 170 p.s.i.g. Pulp of about the same analysis can be obtained in 20 minutes with 50 g.p.l. liquor and 115 p.s.i.g. Alpha-cellulose content is 93 to 95 percent.

Alpha-cellulose content may be regulated between 85 and 95 percent depending on conditions used. It is estimated that 90 percent of the alpha-cellulose available in the wood (determined by modification of TAPPI Standard T9m) is retained in the pulp.

Permanganate numbers covering a range from 9.0 to 33 are tabulated for some of the pulps. No quantitative relationship between permanganate number and lignin content of pulps could be found.

No data on viscosity, D.P. number, or alkali purification of pulps are presented in this study.

SEMICHEMICAL PULPING USING KRAFT LIQUOR

E. M. Leavitt

The plant was built with maximum flexibility to produce hardwood semichemical pulps or modified kraft pulps. The main features are:

1. Concentrated control of process on operating floor.
2. Yields 1 to 1.05 tons of pulp per cord of wood.
3. Low chemical costs due to use and recovery of kraft liquors.
4. Quality is indicated as being equivalent to that of neutral sulphite semichemical.
5. Liquor recovery at about 8 percent solids is returned to kraft black liquor recovery system.
6. Losses to sewer are about 5 to 10 pounds of salt cake per ton.

SOME OBSERVATIONS ON SULPHATE TURPENTINE RECOVERY

M. R. Dusenbury and J. E. Reese

Recovery of crude sulphate turpentine is becoming of more economic importance as a stable market has developed for this material. Southern pulp mills recover up to 4 gallons per ton and northern mills recover somewhat less. Some of the important factors in the design of recovery units are discussed. The design of an automatic decanting tank for separation of crude sulphate turpentine and steam condensate is given which minimizes trouble with emulsion formation. Corrosion of steel by crude sulphate turpentine is caused by the sulphur compounds which are present, and it is quite severe, particularly in the vapor phase and at a pH below 8. A simple method of preventing this corrosion has been found which consists of adding 0.25 of 28 percent aqueous ammonium hydroxide to the crude sulphate and turpentine. This method has been used to prevent corrosion in tank cars and storage tanks.

THE STRESS STRAIN BEHAVIOR OF WET-STRENGTH PAPER

T. S. Morse, R. T. Mashburn, and W. H. Markwood, Jr.

The Instron tensile tester has been used to measure the energy which wet and dry paper can absorb: (1) when stressed at a continuous rate to the break point, and (2) when cycled several times through stress and relaxation cycles at a maximum load slightly below the "yield" point, then stressed to failure.

Data are presented for laboratory-prepared papers made from unbleached kraft pulp at high freeness. One wet-strength resin only was used in the range of 0 to 5 percent.

Dry paper containing the resin absorbed more energy than dry paper without resin, but only because the resin increased the ultimate breaking load of the sheet. The resin produced no measurable change in the elongation of the dry paper. Wet paper containing the resin absorbed a great deal more energy than wet paper without

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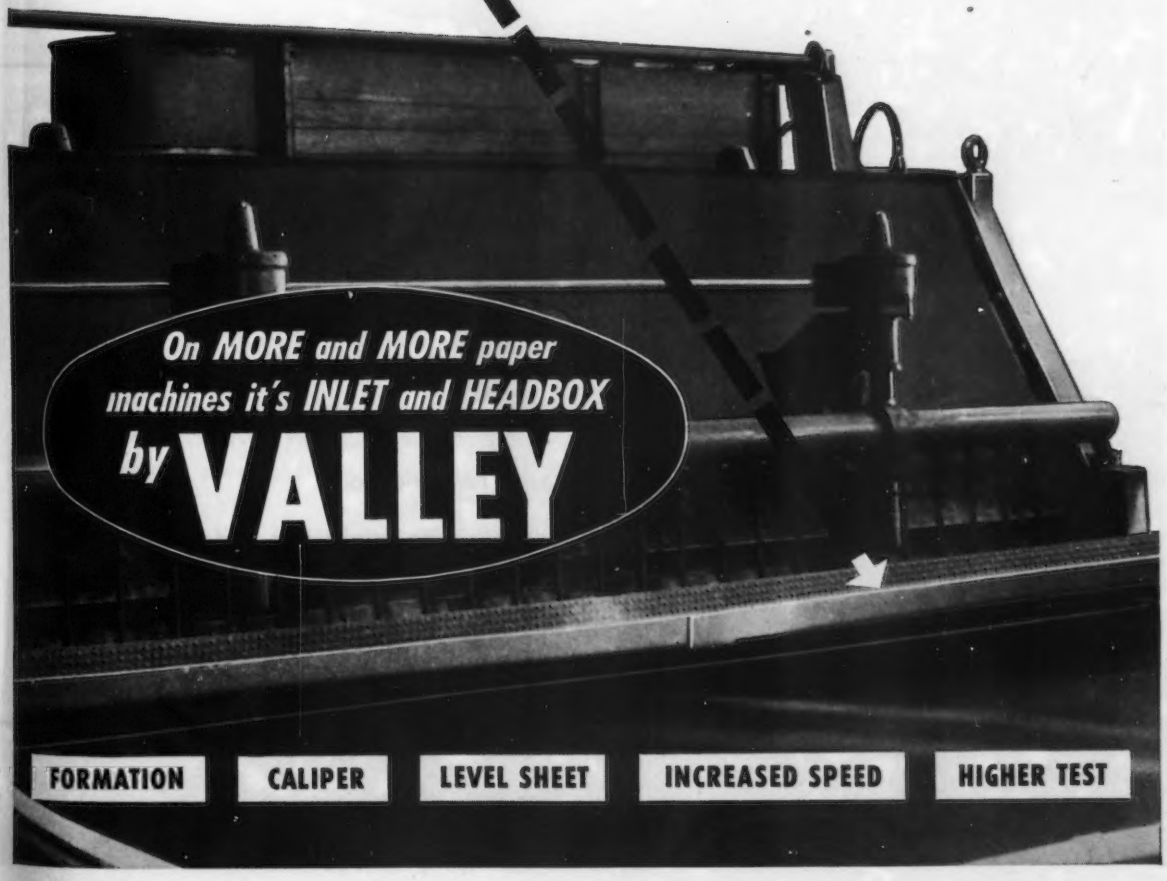

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resin because both the ultimate breaking stress and the elongation were increased.

A special device is described which made it possible to obtain stress strain data while the test specimen was immersed in water.

EFFECT OF CHIP SIZE IN KRAFT PULPING

W. J. Nolan and Wilson F. Brown

Slash pine chips, much smaller in cross section than standard mill-size chips, have been pulped and yield data, chemical analysis, and physical strength of resultant pulps are compared to those obtained by pulping regular chips under identical conditions. Chip reduction was obtained mechanically by use of a hammer mill with ½-inch expanded metal discharge screen. In one case, dry chips were fed to the hammer mill. In the second instance, chips were steamed 10 minutes at 170 psig. in dilute sodium carbonate solution before being fed to the mill. Mechanically treated chips were separated into screen fractions of 4, 6, 8, 10 and 16-mesh. These screen fractions indicate cross-section dimensions at right angles to the grain as all fractions were about as long in grain direction as untreated chips.

These small cross-section chips can be pulped to about 50 percent screened yield in 1.5 hours as compared to 43.4 percent in 2.5 hours from regular chips cooked under identical conditions. Pulps from chips hammer-milled without steaming are slightly lower in tear but otherwise as strong as pulps from regular chips. Pulps from chips which had been hammer-milled after presteaming were stronger in tear and fold and about equal in other factors when compared to pulps made from regular chips.

Physical strength values of pulps made from small size chips remain about constant from 4 through 8-mesh; 10-mesh shows a slight decrease and 16-mesh shows a definite drop in strength.

Hammer-milling of dry chips prior to cooking offers good promise to present mill operation. Bulk density is 24 percent higher than regular chips, yields of screened pulp are 50 instead of 43.4 percent and cooking time is reduced by 1.0 hours from the 2.5 hours for regular chips. Shorter cooking times with tolerance of some screenings in pulp offer prospects of even higher yields if hot refining is used.

The application of hammer-milling chips which have been presteamed should be confined to continuous pulping. Bulk density of treated wood is only 77 percent that of regular chips, chip ends are broomed out and chips appear somewhat porous, making them well suited for high reaction velocity with minimum degradation.

PICK TESTING OF OFFSET PAPERS

Gordon C. Wheeler and Robert F. Reed

When paper is printed on a cylinder press, its contact with the printing surface is longer than the actual impression period. Therefore, its rate of separation from the printing surface, and the force required, depend not only on the press speed, but also on tack of the ink, the stiffness of the paper, and stretch or slack in that part of the paper already printed. Since, on sheet-fed presses, the stretch and slack are cumulative, the rate and force of ink-film rupture accelerate from front to back of the sheet, resulting in an increasing tendency to pick the paper toward the back edge. However, the picking tendency is reduced somewhat through energy absorption by the paper. In determining pick strength of paper, therefore, it is necessary to simulate closely the conditions that exist in the printing impression.

Picking of paper is defined to include all forms of rupture except the occasional lifting of individual surface fibers usually called linting. The most common form in both uncoated and coated papers is a rupture of internal fiber bonds. Picking stresses are greater in offset than in letterpress printing because of the thinner ink film and tackier inks used, and probably because of the greater conformability of the blanket to the paper surface. Picking stresses are greatest when there is complete ink coverage over relatively large areas.

A simple pick tester has been designed to operate on the offset principle. It consists of a pendulum that carries a spring loaded hammer and produces an ink impression by impact. Its elements are adjusted to produce approximately the same pressure, period of contact, and rate of separation, as an offset press at normal printing speed. Standard tack-tested inks are used, and both tack and speed, rather than speed alone, are varied.

Pick-test results on twenty-four papers were found to correlate well with offset press tests using the same series of tack-tested inks, and much better than the wax test or a test using the letterpress principle in which speed alone is varied.

METHODS OF INCREASING THE EFFICIENCY OF WET-STRENGTH RESINS

J. Vernon Kindall and J. B. Davidson

A study has been made to determine the conditions required for the optimum efficiency of a cationic urea-formaldehyde resin. At the point of addition of the resin, it was found that the wet strength was favored by a low pH and the absence of sizing materials. Following resin addition longer contact time of the resin with the pulp was found to decrease the plugging of the felt with resin. These longer contact times can be obtained practically since the action of the jordan was not found measurably to reduce the wet strength obtained. Reduced maintenance costs can be obtained at a higher pH on the machine though with a reduction in the wet strength.

PROBLEMS IN TESTING WET-STRENGTH PAPER

C. S. Maxwell

The problems of testing wet-strength papers and in reporting and interpreting the results obtained are discussed. The pH of the saturating water is an important factor in determining the rate of hydrolysis of the wet strength resin with the resulting loss of wet strength. It is pointed out that unbuffered (e.g. distilled) water tends to assume the pH of the paper soaked in it and may give erratic and misleading results, whereas buffered waters maintain their original pH and give much more reproducible results.

Rosin sizing itself imparts some wet strength, but, at the same time, complicates the testing proeedure by requiring a longer time for complete saturation—during which time a loss of true wet strength can simultaneously occur. It appears feasible to use a wetting agent on such papers for routine control, provided its effect on the test has been previously established. The problem of correlating off-machine, natural and accelerated aging data are discussed as well as the various methods used in reporting results.

A MILL CONTROL METHOD FOR WET-STRENGTH PAPERS

A. G. Durgin and W. G. Baker

A method is presented that correlates the wet strength of paper as it leaves the paper machine with the wet strength after natural seasoning.

The type of wet strength resin used and grade of paper produced affect the test and necessitate the use of different conversion factors. For each resin and grade of paper this factor is obtained experimentally from a quick test and a standard test after seasoning.

LEVER SPORE CLOUD METHOD FOR THE EVALUATION OF ANTI-MYCOTIC PROPERTIES OF PAPER AND PAPERBOARD

L. J. Vinson

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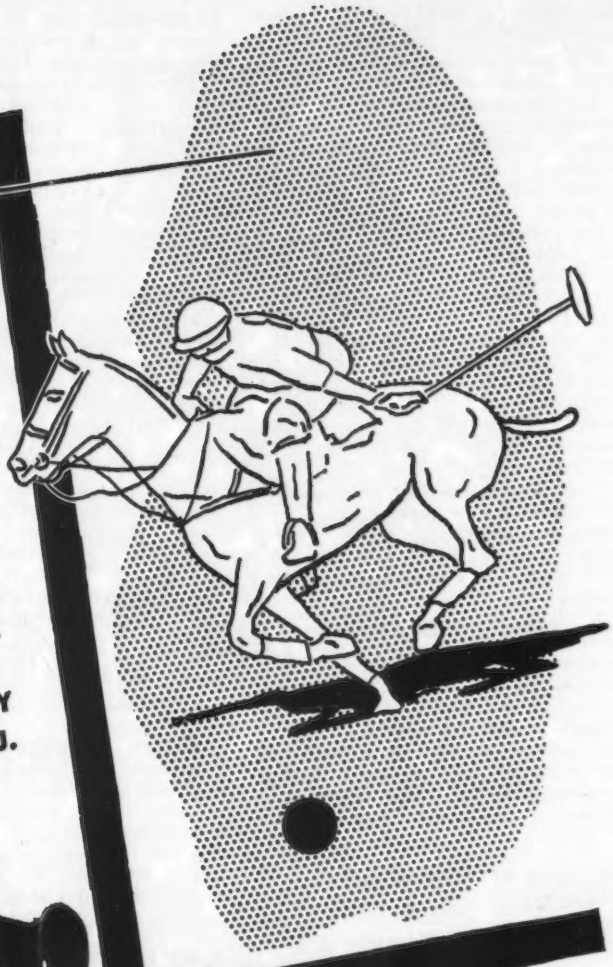

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the degree of resistance of antimycotic-treated paper and paper board towards representative mold strains associated with soap spoilage.

The inoculum comprises a highly sporulated mixture of the test organisms *Aspergillus sydowi, Aspergillus versicolor,* and *Penicillium chrysogenum,* isolated from moldy soap. It is prepared by growing the molds on wheat bran under controlled conditions; the mold bran is dried and stored in quart Mason jars which serve as inoculation chambers. A heavy spore cloud is created upon slight agitation of the jar. An amount low as 25 grams of mold bran can be used for many months as the source of the spore cloud inoculum. This eliminates the need for frequent and tedious preparations of inocula as in other assay methods.

One-inch squares of inoculated paper are placed on modified Czapek agar plates and incubated at room temperature. The plates are examined after 7, 14, and 21 days and rated for mold development.

Antimycotic data with the Lever spore cloud method agree well with accelerated storage results for soap wrapped in moldproofed paper.

The importance of protecting soap wrapping material against mold attack cannot be underestimated since appearance of mold on soap in storage is always associated and preceded by the appearance of mold growth on the wrappers.

FACTORS AFFECTING SLIME GROWTH

L. A. McKeown

Various factors are studied that affect the quantity of slime deposit in a paper mill system. These factors are of two classes being biological or mechanical in nature. The mechanical factors are the more important since they determine the extent of activity that the biological factors may exert. The influence of the mechanical factors can be corrected for by improved mill design.

MECHANIZATION OF SHEET PAPER COUNTING

Charles Stevens

Paper mill finishing processes generally are not only obsolete and outmoded by many years, but represent a most wasteful utilization of factory space, labor, and materials. Finishing labor costs viewed against those of production, reveal figures that urgently demand equipment and revolutionary revision of methods, directed to bring them nearer into balance. Increasingly critical labor conditions, coupled with that of raw material costs alone, further brings finishing cost reduction to the vital point.

Finishing room equipment and methods, even though the most wasteful of the entire mill, are very little different than they were many years ago. The finishing step of sheet paper counting alone, stands out as a most unnecessary and wasteful use of manual labor. Mechanized counting, as a time and production proven exponent, has, after all these years, become a reality.

"Automatic counting" is the mechanization of sheet paper counting, as a production process, constituting both machines and methods in an operating combination to supplant laborious manual counting of paper, sheet-by-sheet.

Machines, as such, alone can only carry counting mechanization up to a point somewhere short of the complete elimination of manual counting. Mill conditions are fundamentally such that the counting equipment must essentially be cooperatively adapted to the nature of the product as well as to the cutting machines, against that of adapting the preparation of the product and its handling, to automatic counting.

Mechanized counting further serves as a direct means of bringing to the foreground, the unnecessary waste of paper, as well as machine and mantime.

Counting equipments are available, which are readily adaptable to paper mill products, mill machines, and mill conditions.

Mechanized counting equipments, procedures, and operational data, are discussed in a detailed analysis, pointing out, from actual mill operations, how it can be utilized with a high degree of efficiency to accomplish consistent accuracy of count at as high as fifty-percent reductions of manual counting line costs.

A VOLUMETRIC GAS ANALYSIS METHOD FOR MEASURING SIMULTANEOUSLY OXYGEN AND CARBON DIOXIDE PERMEABILITIES

Arthur H. Landrock and Bernard E. Proctor

A method has been developed for measuring the permeabilities of oxygen and carbon dioxide simultaneously by utilizing Dalton's law of partial pressures, which states that in mixtures of gases each gas behaves independently of other gases present and the total pressure is the sum of the partial pressures. Each gas in permeating a sheet will, therefore, permeate according to its partial pressure differential across the sheet.

The application of Dalton's law to the measurement of gas permeability is not entirely new. Platenius in 1946 developed a simple form of apparatus for this measurement also based on Dalton's law. Platenius, however, was interested only in oxygen permeability and its relation to the respiration of fresh produce.

In the method developed and studied at the Department of Food Technology at the Massachusetts Institute of Technology, a large metal cell is designed in such a way that it provides a lower static chamber of known volume (about 5850 ml.) and an upper sweeping chamber of about 1500 ml. The test sheet is mounted between these two chambers and, with the help of rubber gaskets, is held rigidly by a specially designed system of clamps.

Nitrogen is swept through the large chamber until it replaces all or almost all of the air present. The actual amount of oxygen and carbon dioxide present is determined accurately with the aid of an Orsat gas analysis unit. To provide high sensitivity, a buret calibrated in units of 0.05 ml. in its lower portion is used.

A mixture of about 80 percent oxygen and 20 percent carbon dioxide is then swept through the top chamber at a slow rate, while the lower chamber is sealed off. The 4:1 ratio of oxygen to carbon dioxide approximately compensates for their differences in permeability through most sheets. Therefore, approximately equal amounts of the two gases permeate the sheet under test conditions. The pressure on both sides of the sheet is atmospheric.

Test periods range from several hours to several days, depending on the permeability of the sheet. At the end of the test, a gas analysis is again made of the atmosphere in the lower chamber. A simple equation permits the calculation of the oxygen and carbon dioxide permeabilities quickly.

A large number of plastic films and laminates were studied, and the results were as good as could be expected with gas permeability measurements without temperature control. The effect of relative humidity was studied on some films, particularly the cellophanes. The apparatus readily lends itself to humidity control.

This method gives results that should closely approximate actual packaging conditions, for the total pressure on both sides of the film is always essentially atmospheric. Because it is necessary to build up only very small amounts of test gases on the nitrogen side of the sheet before they can be accurately measured, the driving force across the sheet remains essentially constant.

DEVELOPMENT OF DESIGN DATA FOR CORRUGATED FIBERBOARD SHIPPING CONTAINERS

K. Q. Kellicutt and E. F. Landt

From an early basic study at Forest Products Laboratory and a current investigation it has been concluded that basic design criteria for corrugated fiberboard containers could be developed from simple tests of the component sheets. In the early stages of the investigations the modulus of elasticity of paperboards, as determined from a tension test was found to correlate with strength properties of the

(Continued on page 44)

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4½x5, 2-ply	10.25/10.75

Paper Towels— per case of 3750

Wh. Jr. M'tif'd 9½x9½	$6.40
Br. Sr. M'tif'd 9⅞x12	4.40
Br. Jr. M'tif'd 9½x9⅞	3.90
Br. Jr. Sgl. fold 9⅞x10¾	3.95
C-Fold 10¼ min. x 14 max.	$5.90/$6.64
Blchd. 7½x11, 48/50 rolls	$6.80/$7.92

Manila, per cwt.

No. 1 Jute Tag, 100-lb., sheets	$20.55/22.55
Reg. Jute M.F. 40-lb., sheets	19.50/21.50
Printing Manila	10.50/12.00

Gummed Tape—per bdl., 500 bdls. or more

90-lb. 375 ft. GSI	$7.20 / —
60-lb. 600 ft. GSI	7.20 / —
35-lb. 800 ft. GSI	8.28 / —
35-lb. 500 ft. GSO	6.21 / —

MARKET WOOD PULP

First Quarter Contract Prices. Per Short Air-Dry Ton

	Varying freight allowances		On Dock Atlantic Ports		
	*U. S.	Canadian	*Swedish	*Finnish	*Norwegian
Groundwood	$92.50/ —	‡$95.00/100.00			
Sulfate, Bleached	145.90/ —	190.00/200.00	$230.00/ —	$230.00/ —	$230.00/ —
Semi-bleached Sulfate	140.00/ —				
Sulfate, Unbl.	132.50/ —	145.00/175.00	200.00/ —	200.00/ —	
Sulfite, Blchd.	140.00/ —	160.00/175.00	225.00/ —	225.00/ —	225.00/ —
Sulfite, Unblchd.	132.50/ —	150.00/160.00	200.00/ —	200.00/ —	
Sulfite, Unbl'd (Glassine)		164.00/ —			
Soda, Blchd.	140.00/ —	155.00/160.00			
Sulfite Screenings	72.50/ —				
Sulfate Screenings	67.50/ —				
Groundwod Screenings	60.00/ —				
Unblchd Sulfate Sideruns	132.50/ —				
Stand. News. Sideruns.	92.50/ —	106.00 —			

* OPS Ceiling, CPR 49 ‡ F.o.b. Shipping Point.

Boards Delivered plant, per ton ..... CPR 108

Filled News	$110.00/ —
Plain Chip	105.00/ —
Blchd. Mla. L.d. Chip	150.00/ —
White Pat. coated .020	175.00/ —
Kr. Liner 42 lb. M sq. ft. $2.47	117.50/ —
Kr. Corr. .009 M sq. ft. $1.59	122.50/ —
Binders Boards	137.50/140.00

The following prices are representative distributors' resale prices:

Rag Content Bonds and Ledgers—
White, 20 lb.

Bonds	4 Ctns.
	per cwt.
100% Rag Ex. No. 1	$70.45/$75.90
100% Rag	62.65/ —
75% Rag	48.15/ —
50% Rag	38.90/ —
25% Rag	31.65/ 33.00

Ledgers	4 Ctns.
	per cwt.
100% Rag Ex. No. 1	$72.65/$72.80
100% Rag	63.90/ —
75% Rag	49.40/ —
50% Rag	40.20/ —
25% Rag	33.00/ 34.30

Sulphite Bonds and Ledgers
White, 20 lb.

Bonds	4 Ctns.
	per cwt.
Watermarked	$19.00/$20.50
Plain	18.40/ 19.50

Ledgers	4 Ctns.
	per cwt.
Watermarked	$20.30/$21.80
Plain	19.35/ 20.80

White Book

Conversion Coated	Case
	per cwt
No. 1	‡ $24.15/$24.65
No. 2	‡ 22.65/ 23.40
No. 3	21.90/ 22.40
Machine Coated	
No. 1	$18.40/$18.90
No. 2	16.65/ 16.90
Uncoated	
No. 1 Antique (Watermarked)	‡ $19.65/ —
Offset	‡ 18.40/ 19.90
A Grade E. F.	‡ 18.40/ 19.00
A Grade S. C.	‡ 18.75/ 19.15
B Grade E. F.	‡ 18.15/ 18.40
B Grade S. C.	‡ 18.65/ 19.15

‡ Indicates a price change.

WASTE PAPER MARKET

Prices to mills, per ton, f.o.b. cars shipping point (includes brokers' fee.) These quotations are a partial indication of the price range in each market on the date specified, as gathered from major dealers. ALL PRICES ARE STRICTLY NOMINAL.

	New York March 4	Philadelphia March 4	Boston March 3	Chicago March 4
No. 1 Mixed Paper	nominal	$7.00/ 10.00	$7.00/ —	$8.00/ —
No. 1 News	$10.00/ 12.00	11.00/ 12.00	— / 9.00	15.00/ —
Over-issue News	15.00/ 18.00	13.00/ 15.00	15.00/ 22.00	18.00/ —
Mill Wrappers	8.00/ 12.00	10.00/ 12.00	13.00/ 19.00	11.00/ —
Corrugated Containers	12.00/ 13.00	11.00/ 12.00	13.00/ —	15.00/ —
Double Kraft Ld. Corr. Cuts	40.00/ 55.00	35.00/ 45.00	40.00/ —	50.00/ —
100% Kraft Corr. Cuts	70.00/ 80.00	55.00/ 75.00	75.00/ 80.00	75.00/ —
Used Sugar & Flour Bags	45.00/ 50.00	35.00/ 45.00	45.00/ 50.00	40.00/ —
Super Resorted Br. Kraft	45.00/ 60.00	40.00/ 50.00	45.00/ 60.00	40.00/ —
New Br. Kraft Env. Cuts	90.00/100.00	100.00/105.00	95.00/100.00	90.00/ —
New Br. Kraft Cuts	80.00/ 90.00	90.00/ 95.00	85.00/105.00	80.00/ —
No. 1 Gdwd Shvs.	25.00/ 35.00	30.00/ 35.00	28.00/ 35.00	25.00/ —
White Newsblanks	55.00/ 60.00	70.00/ 75.00	55.00/ 75.00	45.00/ —
No. 1 Flyleaf Shvs.	40.00/ 55.00	40.00/ 50.00	45.00/ 70.00	50.00/ —
No. 1 Soft Wht. Shvs.	120.00/130.00	110.00/125.00	120.00/130.00	115.00/ —
Super Soft Wht. Shvs.	140.00/150.00	130.00/140.00	135.00/150.00	125.00/ —
Hd. Wht. Shvs.	140.00/150.00	140.00/150.00	145.00/165.00	130.00/ —
Hd. Wht. Env. Cuts	155.00/165.00	155.00/170.00	160.00/170.00	140.00/ —
New Manila Env. Cuts	100.00/105.00	95.00/115.00	100.00/110.00	55.00/ —
Col. Tab Cards	70.00/ 80.00	60.00/ 70.00	65.00/ 75.00	55.00/ —
Manila Tab Cards	110.00/120.00	110.00/120.00	110.00/120.00	90.00/ —
No. 1 Mixed Ledger	50.00/ 60.00	60.00/ 65.00	60.00/ 70.00	55.00/ —
White Ledger	80.00/ 85.00	85.00/ 90.00	85.00/ 95.00	70.00/ —
No. 1 Book & Mag.†	28.00/ —	18.00/ 22.00	28.00/ 32.00	20.00/ —
No. 1 Rep'd. Hvy. Books‡	40.00/ 45.00	27.00/ 32.00	40.00/ 55.00	35.00/ —

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% groundwood. § Deld.

RAG MARKET

New Domestic Cotton Cuttings
OPS Ceiling Price, CPR 28 *
Delivered Mill Basis

No. 1 White Shirts	$20.00/$21.00
No. 1 Unblchd. Muslins	20.50/ 21.00
Blchd. & Unblchd. Underwears	— / 21.00
Blchd. Canton Flannels	— / 21.00
No. 1 Light Silesias	15.50/ 16.00
No. 1 Light Prints	10.50/ 11.50
No. 1 Blue Overalls	14.00/ 14.50
Suntan Khakis	— / 13.50

Add 10% Dealer Commission

Fancy Shirts	$11.00
Indigo Blues	10.00
Mixed Khakis	3.00
Corduroys	9.00
Cottonades	10.00
No. 1 Washables	5.50

Old Domestic Cotton Rags
(Prices to Dealers, f.o.b. Ship. Pt.)

	Per 100 lb.
Mixed White	$6.00/$6.50
Cotton Pants & Overalls	5.25/ 5.50
Thirds and Blues, Repacked	4.25/ 4.50
No. 1 Roofing Rags	1.20/ 1.25
No. 2 Roofing Rags	1.00/ 1.10
No. 3 & 4 Roofing Rags	.90/ 1.00

Bagging
(Prices to Dealers, f.o.b. N. Y.)
PRICES NOMINAL

	Per 100 lb.
Foreign Gunny	$5.50/5.60
Domestic Gunny, No. 1	5.50/ 6.00
Heavy Wool Tares	5.50/ 6.00
Foreign Manila Rope	9.00/ 9.25
Domestic Manila Rope	9.00/ 9.50
Jute Strings	6.50/ 7.00
No. 1 Sisal Strings	8.00/ 8.50
Paper Mill Tares	5.50/ 5.75
Foreign Scrap Burlap	5.25/ 6.00
Domestic Scrap Burlap	5.50/ 6.00
Austr. Wool Pouches	7.50/ 8.00
New Burlap Cuttings	7.00/ 7.50

MATERIAL PRICES

Aluminum sulfate:		
coml. bags, wks.....cwt.	1.65	
iron-free, c.l.	3.25	
Alcohol, ethyl:		
tax free, dms. c.l.....gal.	1.01	/ 1.05½
deld. East Miss.		
Alcohol, methyl:		
Synthetic, Zone 1, dms. c.l. fit. alld.....gal.	.44	
Casein, acid prec.:		
dom. sh. pt. c.l. .....lb.	.27	/ .35¾
imp. ex. dock .....lb.	.20½/	.25
Caustic soda:		
c.l. wks. solid, 76% cwt.....	3.35	
flak. & grd. 100-lb. drums...	3.75	
liquid 50% tanks....	2.55	
liquid 70% tanks....	2.65	
China clay:		
dom. air-float. c.l. wks. ton	10.00	
water-washed, lump, filler....	11.00	
coating	17.60	/30.50
imported, ex whse...short ton	15.20	/28.35
Chlorine:		
single-unit tanks, works..cwt.	2.70	
multi-unit .....cwt.	3.20	/ 4.40
Formaldehyde:		
USP, inh. dms, c.l. wks....lb.	.0625/	.0675
l.c.l., E. wks.....	.0675/	.0725
Fuel oil:		
Bunker C, No. 6 Cal. hvy. tanks, refinery .....bbl.	1.95	/ 2.15
light .....bbl.	2.00	/ 2.25
Hydrogen peroxide:		
USP, 35% cbys. E. of Miss. lb.	.23½/	.26½
Lime:		
hydrated, bags, wks. .....tons	13.50	
Rosin:		
B gum, drms, c.l. Savan..cwt.	7.00	/ 9.08*
K, M, N .....cwt.	7.50	/ 9.49*
FF, wood, do.....cwt.	6.80	/ 7.30*
*OPS Ceiling, CPR 52.		
Rosin size:		
70%, gum & pale grds, tank cars, south, sh. pt. .....cwt.	6.60	/ 6.70
Salt cake:		
dom. bulk, c.l. wks.....ton	17.00	
wks. frt. all.....ton	20.00	/22.00
Soda ash:		
light, 58%, bags, wks.....	1.50	
bulk .....cwt.	1.20	
Sodium silicate, 40°:		
turbid. c.l. wks.....cwt.	1.30	/
l.c.l. wks.	1.60	/ 1.85
Sodium peroxide:		
dms. c.l. E. of Miss.....lb.	.21	
l.c.l. do. .....lb.	.21½/	.22
Soybean, protein:		
chem. isol, wks, c.l., bags..lb. Cinn. and Chic.	.25	/ .29
Sulfuric acid:		
60° Be. cbys. c.l. wks.....cwt.	1.75	/ —
l.c.l. wks. .....cwt.	2.05	/ 2.85
Sulfur:		
crude, c.l. mines, contract, long ton	21.00	/22.00
f.o.b. vessels Gulf	22.50	/23.50
Sulfur dioxide:		
liquid, coml. cyl. wks.....lb.	.09	
multi-unit cars .....lb.	.0535	
Starches:		
pearl corn, bags, c.l. wks..cwt.	6.44	/ —
white dextrines, c.l. wks...cwt.	7.83	/ —
potato, Idaho, c.l. wks....cwt.	nominal	
potato, Maine, c.l. wks....cwt.	nominal	
tapioca, conv. dextrines...cwt.	7.25	/ 8.25
Talc:		
domestic, 50-lb. sacks, c.l. wks. .....ton	25.00	/30.00
Titanium dioxide:		
anastase, c.l. deld., bags...lb.	.21	/ .21½
l.c.l. deld. .....lb.	.22	/ .22½
rutile, c.l. deld.....lb.	.23	/ .23½
l.c.l. deld. .....lb.	.24	/ .24½

NEW LITERATURE

Associated Research, Inc., 3758 West Belmont Ave., Chicago 18, Ill. Bulletin 10A, "Precision Instruments by A.R." Includes basic data on "Vibrotest" for electrical insulation resistance testing; "Vibroground" for ground resistance testing; "Hypot" for hypotential dielectric strength testing; "Donut" instrument current transformers; Precision Ohmeters; Voltammeters; and other special instruments.

Beloit Iron Works, Beloit, Wis. Bulletin, featuring "The Paper Story," in a twenty-five minute, fast-moving, sound-color film, describing the mills, men and machines behind modern paper making.

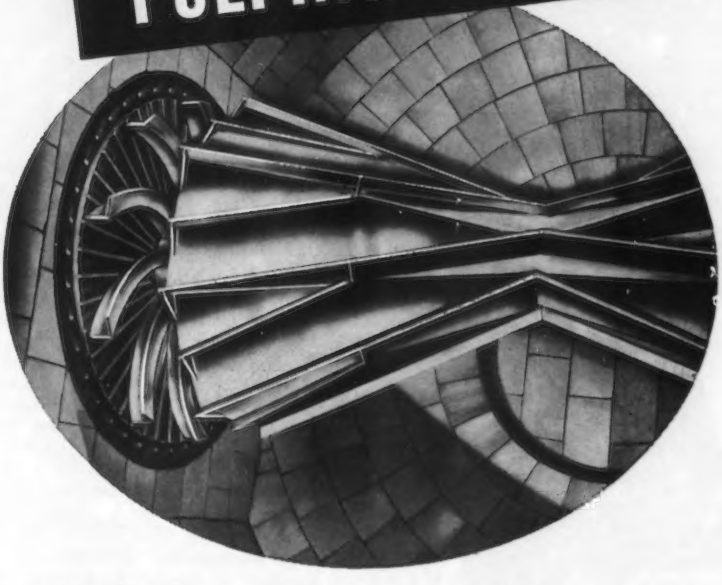
Black-Clawson Co., Hamilton, Ohio. Brochure, "The Messenger." Features: Manufacture of Paper Machinery; Pulping Houdinis; Hydrapulper Accessories; Why Dilts Developed Their Double Embosser; Dilts Waxing System.

The Bristol Co., Waterbury 20, Conn. Bulletin W1805, a complete list of all Bristol's products, Directory of Branch Offices and Associated Companies, Officers and Dept. Heads,

E.D. Jones

Rotor of No. 4 size Jones Pulp-Master, shown in tile tank installation in a leading midwestern mill. Capacity 4000 lbs. 6½% stock.

PULPING POWER



The rugged, one-piece fabricated rotor of the PULP-MASTER, placed well above the bottom of the tank, gives stock vigorous, continuous circulation — yet allows junk metal to drop to the tank bottom.

Its vanes force the stock outward, where the impellers rub and refine it against the fixed refining discs. Baled pulp, waste paper, machine broke — even glassine and wet strength — is completely disintegrated in 10 to 40 minutes.

Over 140 sold to date. Ask your Jones representative for details — or write for Bulletin 1019-B.

E.D. Jones **PULP-MASTER**

E. D. Jones and Sons Company, Pittsfield, Mass

BUILDERS OF QUALITY STOCK PREPARATION MACHINERY

Trade Names Used by The Bristol Co., Condensed Listing of Products.

Broadway Rubber Corp., 529 E. Broadway, Louisville 2, Ky. Catalog, Contains 14 pages of technical and general information for problems of corrosion in equipment.

L. L. Brown Paper Co., Adams, Mass. Booklet, "How to Get Greater Service and Value from Your Records and Letters." Gives the basic difference between rag and wood papers, shows microscopic enlargements of fibers, and points out structural and other dissimilarities. A distinctive feature is data relating to relative cost of quality papers by means of graphs, test and tables.

The Carpenter Steel Co., Alloy Tube Division, Union, N. J. Four-color segregation chart, designed to help users of stainless steels quickly identify stainless types.

The Cowles Co., Inc., Cayuga, N. Y. Bulletin, "New Cowles Aquaplater." Technical and sales copy.

American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. Book, "Paper and Paperboard." Revised and expanded edition of the 1944 Mongrapn on Paper and Paperboard (characteristics, nomenclature, and significance of tests), issued January 21 by American Society of Testing Materials. 140-pp. at $2.50.

E. I. du Pont de Nemours & Co., Rubber Chemicals Division, Wilmington, Del. Bulletin, "Neoprene Treated Paper." Technical copy.

Waste Paper
We are always in the market for combination truckloads or carloads of high grades and specialties
PIONEER PAPER STOCK COMPANY

The Electric Products Co., 1725 Clarkstone Rd., Cleveland 12, Ohio. Bulletin 10-210, "Type S. Single-Circuit Motor-Generator Battery-Charging Equipment." A simplified listing to make easy the selection of the right charger for any popular size truck battery.

Paper Cup and Container Institute, Inc., 551 Fifth Ave., New York 17, N. Y. Brochure, "Single Service News." Features: London Conference on Civil Defense Feeding; Stockpile Report.

The International Nickel Co., Inc., Development and Research Division, 67 Wall St., New York 5, N. Y. Booklet, "Rapid Identification of Some Metals and Alloys." Available gratis.

Isotope Products Ltd., Oakville, Ontario, Canada. Catalogue No. 2, "Isotope Products Limited." Featuring "The Gammagage", a new radioactive gauge for the measurement of corrosion in tanks and pipes.

Kimberly-Clark Corp., Neenah, Wis. Magazine, "Cooperation." Recognizing the 80th anniversary of the founding of Kimberly-Clark Corp. The magazine's lead story points up "American enterprise at work," illustrated in Kimberly-Clark's expansion since 1947, when it observed its diamond jubilee. Pictures which accompany the story mark the major events in the Corp. during the last five years, including the expansion of Memphis, now a 3-machine mill and awaiting the advent of a fourth machine this summer; LongLac Pulp and Paper Co., Ltd., of Terrace Bay, Ontario, Canada, which started production in 1948 and now is producing 60 tons more a day than it did at the start-up; and Terrace Bay itself, the community carved out of the wilderness above Lake Superior where an additional 35 new homes will be built this summer. . . . Also introduces a story "Calling Cards on Wheels," about the growing fleet of railroad cars which bear the corporation name. The most current project is reconditioning of a fleet of 100 flats for use in hauling pulpwood.

Nordwestdeutsche Exhibition Co., Ltd., Ehrenkof 4 Dusseldorf, Western Germany. Bulletin, "Drupa, International Exhibition of Printing and Paper." Course and results of the exhibition held in Dusseldorf, Western Germany, May 26th to June 10th, 1951.

Paisley Products, Inc., 1770 Canalport Ave., Chicago 16, Ill. Bulletin 16, new and revised 8-page illustrated Technical Service Bulletin, "Round Container Labeling." Published by Paisley Products, Inc. Sections deal with food container labeling, chemical product container labeling, government specification container labeling, and a description of labeling methods, spot labeling and wrap-around labeling.

The Paper Maker, 3 Tudor St., London E.C.4. "Phillips' Paper Trade Directory of the World." 1952 edition, 800 pp. Includes world paper, board and pulp mills, sizes and numbers of machines and annual output, by classes of paper board. Also includes agents and sales offices, Associations and Federations, and a glossary of trade terms in six languages. In foreign section is an illustrated list of Scandinavian pulp marks. 37/6d. per copy, post free.

Prufcoat Laboratories, Inc., 50 East 42nd St., New York 17, N. Y. "Prufcoat Technical Bulletin No. 501." Shows in chart form the chemical resistances of various types of Prufcoat.

FINANCIAL

Fraser Cos. Ltd. has declared a dividend of 75c on common, payable April 21 to shareholders of record April 4.

British Columbia Forest Products Ltd. is expected to offer soon a $5 million issue of 10-year 5 percent convertible sinking fund debentures at par through a syndicate of investment dealers.

Gaylord Container Corp. has declared a cash dividend of 37½c per share on its common stock payable March 10 to shareholders of record March 1. The board also declared a special dividend payable in common stock of the company equivalent to 5 percent of the common stock presently outstanding, payable April 16, to shareholders of record March 26.

Keyes Fibre Co., manufacturers of molded pulp products and fibrous plastic articles, report sales reached a new high of $10,526,237 for the year ended December 31, 1951, according to preliminary figures. Sales for the previous year amounted to $9,590,640.

Net income from operations after all charges and before provision for income and excess profits taxes are reported at $2,976,544 for 1951 compared with $2,722,256 for the previous year, an increase of $254,288.

Income and excess profits taxes were $1,910,626 in 1951 compared with $1,360,461 in 1950 leaving net profit, after taxes, of $1,065,917 compared with $1,361,795 for 1950.

St. Lawrence Paper Mills Co., Ltd., has been granted supplementary letters patent by the Secretary of State of Canada for the purpose of altering the capital stock of the company so that it now consists of 480,355 common shares without nominal or par value.

Brompton Pulp and Paper Co. Ltd. has been granted supplementary letters patent by the Secretary of State of Canada for the purpose of altering the capital stock of the company so that it now consists of 206,000 common shares without nominal or par value, according to notice filed at Ottawa.

Puget Sound Pulp & Timber Co. has declared a quarterly dividend of 50 cents a share on the common stock, payable March 31, to stockholders of record March 7, 1952.

New Equipment
Supplies and Materials

Remote Weight Recorder

An electronic remote weight recorder is announced by Howe Scale Co., Rutland, Vt.

Known as Teleprint, the instrument is described as a revolutionary and important contribution to increased weighing accuracy. It can be furnished for operation with any of the manufacturer's Tape-Drive Dial Scales. Used with the Unit Weight Cabinet Dial, the unit weights are integrated into the printed record. When used remotely, unit weights can be added electrically from a switch on the recorder box.

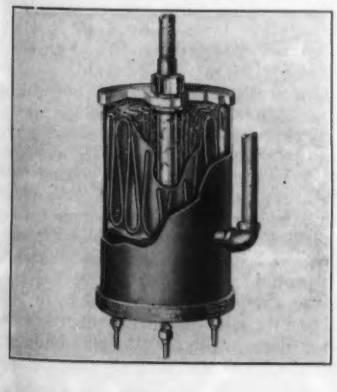
Equipment can be operated with standard electrical components at a distance up to 1,000 feet from the scale, it is stated. Normally, printing action is controlled by push button on control panel of recorder, but can be controlled by other methods to suit various types of operation. Instrument can be mounted on standard portable stand, on a desk, built into dial, or placed to exactly fit user's need. Accuracy is guaranteed to 1/10th of 1 percent of dial chart capacity.

A variety of ticket guides can be furnished: one position guide; two-stop guides for printing gross and tare; universal ticket guide for printing in different columns and on different lines. Prints up to nine distinct duplicates depending on thickness of ticket and type of carbon used. Also has roll-tape adaptation for one or two rolls of tape. A "hold and print" switch can be furnished which will permit either straight "weigh and print" or unlimited repeat printings after load has left the scale. Many types of special applications are possible.

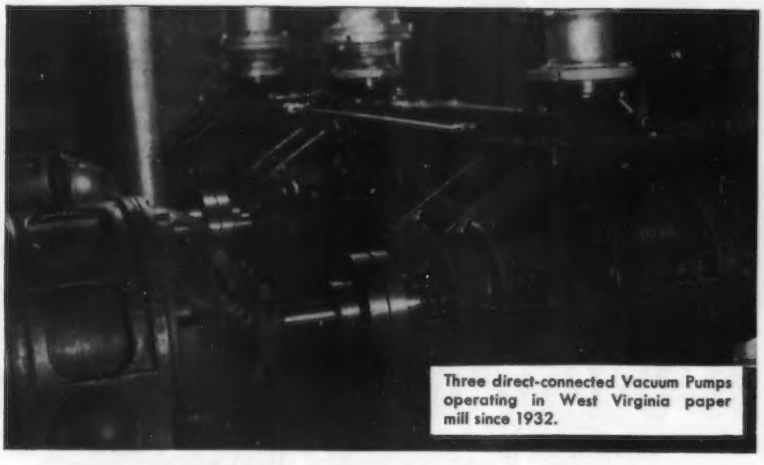
Cartridge-type Filter

A new combination of cooling coil and a cartridge-type filter element to apply in a compressed-air line is announced by Hankison Corp., 282-A Renton Bldg., Pittsburgh 33, Pa.

Known as Condensifilter, it is composed of single unit which measures 9 ins. O.D. by 15 ins. in height, and rates 30 c.f.m. at 100 lbs. It is said to be particularly suited to dry and to remove foreign matter from compressed air for combustion, chemical processing, and other industrial purposes.



Compressed air is connected in the side of housing to fill the chamber surrounding the filter and cooling coil. Cooling-water inlet and outlets are connected at the bottom into coil. Connection also is made to a discharge trap from bottom of housing. Air surrounds the coil and is cooled before moving upward through the annular space between coil and housing, thence down into the filter. Provided in that part of the assembly is about 4 square feet of filtering area made up of five hexagonal and parallel filter chambers, each wrapped with seven layers of canton flannel. Clean dry air issues from pipe connection at center of housing top. Provision is made for removal of filter element so it can be cleaned in immersion in a suitable solvent.



Three direct-connected Vacuum Pumps operating in West Virginia paper mill since 1932.

COMPARE THESE 5 VALUES WHEN YOU BUY VACUUM PUMPS

Outstanding satisfaction with Roots-Connersville Vacuum Pumps for paper mill operation has been gained by their high ratings in these five essentials to adequate performance. Our engineers will gladly work with you in selecting equipment for your specific needs. Send for Bulletin 50-B-13, which deals exclusively with R-C Cycloidal Vacuum Pumps for Paper Mill Operation.

1. **LOW POWER CONSUMPTION**—because units are recommended, either single or compound, to operate at the most efficient point.
2. **NEGLIGIBLE FRICTION LOSSES**—no contact between impellers or impellers and casings.
3. **HIGHER SPEEDS**—permitting direct connection to standard motors, saving first cost, space and weight.
4. **FLEXIBILITY**—to meet varying demands; suction automatically overcomes resistance in system.
5. **DEPENDABILITY**—long-time, attention-free operation, due to simplified design and construction.

Roots-Connersville Blower Corp., 521 River Ave., Connersville, Indiana

Reg. U.S. Pat. Off.

ROOTS-CONNERSVILLE

BLOWER BUILDERS SINCE 1854

ONE OF THE DRESSER INDUSTRIES

Odor-Less Dampcoat Enamel Color System

A color system devised by the Wilbur & Williams Co., 130 Lincoln St., Boston 35, (Brighton), Mass., in their Odor-Less Dampcoat Enamel permits painting over damp surfaces as well as dry.

Six basic intense colors are the source of intermixing with white and themselves to meet every decorative color scheme making possible 1800 or more tints and colors, it is said. Feature of this color system is that it eliminates any tinting tube or agitant, and merely calls for easy intermixing. Chemically-developed high colors, which in themselves can be used in their own intensity for deep tones, and which intermixed with white, are now capable of meeting all industrial and decorators' color needs.

Operator's Console Desk

A newly-designed console desk which makes it possible for a seated operator to obtain plant temperature readings up to 96 processing points in about as many seconds has been developed by Minneapolis-Honeywell Regulator Co., Brown Instrument Div., Wayne & Windrim Ave., Philadelphia 44, Pa.

Designed to eliminate constant walking and logging from one end to the other of a long or divided panel board, the console is a 60"-wide steel executive-type office desk arranged with cutouts to accommodate an ElectroniK precision indicator and key switch banks or push-button assemblies. It is made of sheet metal fabricated in special color, pattern and design. The desk is equipped with drawers in conventional arrangement, left and right hand slides, center drawer with utility tray, three single-depth drawers on the left, one single-depth and one double-depth or filing drawer on the right. Space is provided on the desk-top for writing.

The desk can be used in any large control room in any industry and can be tied in with any single, multiple or Colorgraphic panel board. Another advantage is that the seated operator does not obscure full view of the panel board from any part of a control room.

(27-T-67)

Pneumatic Chip Handling System

Conveyair (Pulp Division) Ltd., North Vancouver, B. C., has developed a pneumatic chip handling system which is believed to have overcome difficulties formerly encountered in feeding chips into an air stream.

This new system uses a small amount of air to carry a large volume of chips, which reduces the power requirements and permits a smaller pipe being used. It also eliminates dust and requires a minimum of labor. The system consists of motor blower units, feeder, tubing and discharge and control system.

Equipment of this type was installed at the Harmac mill of MacMillan and Bloedel last year. This unit was designed to take both fir and hemlock chips from trailer units and discharge them into separate silos at a rate of 40 units per hour. The work involved a lift of 70 feet and a horizontal travel of 125 feet.

This system has a 130 hp. power plant. There are four blower units, each driven by a 25 hp. motor, while the feeder unit is driven by a 30 hp. motor. The equipment is housed in a small building and receives the chips from trailer dump by a chain conveyor. The feeder and blowers discharge into a pipe 7¾" in diameter, the pipe being supported by brackets on the side of the silo.

The silo selector unit is placed below the gallery walk on the silo building. Chips are blown directly into either

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for the addition of moisture and chemicals
SPRAY ENGINEERING CO.
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Write for new TECHNICAL BULLETIN

of the silos without the use of large cyclones and without creating dust or interference with other equipment.

Automatic Tree Planter

Forester John Halpenny, of Cornwall, Ont., has invented an automatic tree planter which is reported to be capable of planting about 1,000 trees an hour. Currently in use in planting large treeless areas in Eastern Ontario, the planter is said to be generally most useful in level, as well as poorly-drained areas. Several hundred thousand trees have been planted by use of such a machine, and it has been found to be satisfactory for conservation purposes due to its inexpensiveness, speed and simplicity of operation.

Equipment is a simple, hydraulic planter which can be raised or lowered by the power lift on the tractor with which it is usually used. The machine is lowered into the sod, parts the earth, and raises a furrow, allowing the seedling trees to be put in. Furrow is then closed and flattened by rubber-tired wheels.

Tractor Truck

A new tractor model has been added to the Truck-Man line of industrial trucks. Designated the "Truc-Tor" Model DR, it is capable of hauling cargo trains of up to 13 times its own weight (990 lbs.) on dry, level concrete, according to the manufacturers, Truck Man Division of The Knickerbocker Co. 638 Liberty St., Jackson, Mich.

Designed as an answer to load limit problems on elevators, floors, docks and dock-boards, this compact tractor is intended to do the work of units weighing and costing three times as much. "Truc-Tor" is equipped with heavy duty industrial pneumatic tires all around, to assure an easy ride and reduce damage. The power turret revolves 360° as in all T models, giving it extreme maneuverability. The heavy duty air-cooled engine of 5.8 hp. is said to operate a full eight hour shift on approximately one gallon of gasoline. An 8-page catalog is available.

New Coating Method

For the paper maker who may not have conventional coaters, size-press formulations using Dow Latex 512-K permit the manufacture of a new line of paper without modification of existing equipment or investment in special coating equipment, according to Dow Chemical Co., Midland, Mich.

Commercial runs have proved that the new coating method gives a brighter, smoother and more opaque sheet in the same cost range as traditional sized coatings, it is said. Because of the thermoplastic nature of Dow Latex 512-K, supercalendering gives the sheet improved smoothness, permitting more faithful reproduction of printing and better lacquer and varnish hold-out. In addition, the use of Dow Latex 512-K in a pigmented size press coated paper also contributes improved wet rub resistance, flexibility and other physical property improvements.

Heretofore, the size press has been used almost exclusively for applying a pure starch sizing for the purpose of laying down the fibers in order to produce a smoother printing surface. Occasionally clay was used with the starch. Papers coated at the size press with this latex adhesive open market possibilities for book papers, offset papers, high quality conversion-coating base stock, and label and packaging base papers requiring good lacquer and varnish hold-out, it is stated.

F-S FREELY SEPARABLE

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Put an end to hammering and prying in your finishing room . . . eliminate roll damage and unproductive labor. The new Johnstone F-S (Freely Separable) Slitters and Roll Winders are setting a standard of performance never before possible. Applicable to any kind of dry, uncoated paper . . . rewound rolls of any width.

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The Heavy-duty FOURTEEN F-S has 6¼" diam. winding drums. Standard sizes handle rolls 42", 52", 62", 72" & 82" wide; rewound diameters up to 36". The TWELVE F-S has 4" winding drums, and standard sizes take rolls 32", 42", & 52" wide; rewound diameters to 24".

Adhesive for Silicone-Treated Surfaces

Silicone coated surfaces can now be strongly adhered with a new adhesive developed by Polymer Industries, Inc., Astoria, N. Y. Interest in this new adhesive is greatly because silicone finishes were hitherto among the most difficult of all surfaces to adhere. In fact, such coatings were noted for their extreme "oiliness" and "non-sticking" properties. Many of the widespread uses for silicone coatings are based on this characteristic, which is related to their great resistance to being wetted.

Among the remarkable features of this new adhesive, known as "Glas-Weld," is that it functions in high-speed gluing machines fully as well as the best standard adhesives. Even in the fastest bottle labeling, carton sealing, bag making and other gluing machines, the Glas-Weld adhesives have been successfully operated on a commercial basis, it is claimed.

Silicone coated paper, wood, ceramics, and metals have also been successfully adhered with this new line of adhesives. The tremendous possibilities inherent in such finishes are no longer being held back through lack of suitable adhesives for the fabrication of bags, cartons, fiber boxes, and cans.

Further information on the Glas-Weld adhesives is available from Polymer Industries at its main office, 11-08 30th Avenue, Astoria, N. Y.; from the branch plant at 284 Sheffield Avenue, Brooklyn, N. Y.; and from Polymer Southern, Inc., Box 2184, Greenville, S. C.

Giant Fog Nozzle for Large Fires

A new giant-size fog nozzle made especially to combat large fires in or out-of-doors has just been announced by the manufacturer, Bete Fog Nozzle Inc., Greenfield, Mass.

Called Bete Giant Model 500 Fog Nozzle, the new nozzle delivers a 500 g.p.m. fog blanket with a large diameter of coverage and an effective reach of approximately 80 feet, according to the manufacturer. It is claimed that the tremendous cooling effect of this large volume of fog will almost instantly extinguish large flammable liquid fires, as well as wood, paint, and other types of hot fires.

Made with 2½" National Standard Thread connection, the new Bete nozzle can be attached directly to a hose or turret gun having this thread, in place of the conventional straight stream nozzle. A unique feature of the Bete nozzle is its spiral atomizing element which contains no small orifices or internal parts. Small stones, bits of hose, washers, or other foreign matter pass freely through the nozzle without clogging. Made entirely of bronze, the new nozzle has external vanes for added strength in rough service.

TAPPI Abstracts

(Continued from page 36)

built-up corrugated board. However, the tension test was discarded as being too precise for general use. After further study it was found that either the ring-crush test or the strip-column test of paperboard could be used for design purposes.

As paperboard is a nonisotropic material it was recognized that a formula applicable to fiberboard with the machine direction parallel to the applied load might not be applicable to fiberboard with the load applied perpendicular to the machine direction of the Fourdrinier or cylinder paperboards. With the recognized characteristics as a guide, a basic formula was evolved paralleling data developed at the Forest Products Laboratory for applying the thin plate theory of mechanics to the design of panels of plywood. Initially the mathematical relationship involved in the bending and crushing of each of the four walls of a fiberboard box was established for the tube.

By use of the formula and test values of the component paperboard sheets the compressive strength of tubes in various sizes, made from corrugated board, could be predicted with reasonable accuracy. The tube, having square cut edges, represents the optimum that can be obtained with any given corrugated board. Hence, to use the formula for design purposes the relationship between the tube and box was established for making the predictions directly for a box.

To determine what portion of the compression test value a box can be expected to support for specific periods of time in storage, long time-loading tests were made. The relationship between the machine compression test value of boxes, the magnitude of the dead load of storage, and the duration of loading have been indicated by these tests.

From compression tests of boxes made in various atmospheres the relationship of compressive strength of boxes to moisture content of the fiberboard was derived. From the known compressive strength of a box having a specific moisture content, the compressive strength can be interpreted in terms of other moisture contents of the fiberboard.

(To be continued next week)

Powell River Overhauls No. 5 Increases Newsprint Output

The No. 5 machine at Powell River Co.'s newsprint plant, B. C., was recently overhauled and transformed to raise the production speed by about 250 feet of newsprint per minute. This will mean 1500 feet per minute.

The most difficult part of the job was the removal of the old head box and the installation of a new one. The wet end, weighing 120 tons, was raised 38 inches so that a greater volume of stock will be able to be delivered to the new machine to meet the new speed.

Fiber gears on the bottom dryers of the machine have been installed so that no metals will be in contact with each other.

No. 6 machine will receive the same treatment in a few months.

The Powell River Co. established a new record for newsprint production last year, becoming the first mill in Canada to turn out an average of more than 1000 tons daily for an entire month.

Standard-Missisquoi Stock Exchange

Standard Cap and Seal Corp. has announced that it is negotiating for the common stock of Missisquoi Corp., Sheldon Spring, Vt. An exchange of stock is the basis of the sale.

The Controlled Flow

VICTORY BEATER

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THE NOBLE & WOOD MACHINE CO.

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STAINLESS STEEL CASTINGS

FOR ALL EQUIPMENT EXPOSED TO CORROSION BY SULPHITE ACIDS OR OTHER CORROSIVE AGENTS

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DETROIT 7, MICHIGAN

PEOPLE

CHARLES M. HOWELL, Millville, N. J., former general manager of the Scott Paper Co., Chester, Pa., is now serving as a lecturer in Paper Technology in the Department of Chemical Engineering at the University of Maine. He joined the Scott Paper Co. in 1921 and after several years of experience in their beater rooms and on the paper machines, he was made tour boss in the paper mill. It was at this time that the Scott Paper Co. established their technical control, and Mr. Howell was the first man to assume the responsibility of technical control for the entire company.

In 1931, Mr. Howell was named engineering manager. He became a member of the board of directors of Scott in 1934, and a year later was named general plant manager.

His teaching and research duties are closely connected with the five-year curriculum in Operational Management. This curriculum, recently initiated, combines the four-year accredited chemical engineering courses with additional work in business management, law and personnel studies as well as technical studies in the fields of pulp and paper production.

LAURENCE S. WRIGHT has been named assistant to the president of Hopper Paper Co. Mr. Wright has been active for many years in advertising and merchandising activity in the textile, building material, floor covering, and paperboard fields. He comes from Bird & Son, Inc., of East Walpole, Mass., where he was advertising and sales manager for many years.

CURTIS R. GEORG has been elected a vice-president and director of the Graham Paper Co. Mr. Georg will move to St. Louis, Graham's main office, during the first part of April, and will be in charge of their coarse paper operations in St. Louis and 24 divisions. PHILIP MILES has been appointed manager of Graham's Eastern Division. Mr. Georg succeeds E. G. KERWIN, who has just completed his fiftieth year with the Graham organization.

THOMAS LEECH, vice-president and sales manager of Whiting-Plover Paper Co., Stevens Point, Wis., succeeded to the position of general manager on March 1, following the resignation of A. J. SCHIERL. Mr. Leech, who has been with Whiting-Plover since 1938, will continue in the capacity of vice-president and sales manager in addition to his new responsibilities. Further action of the directors' meeting elevating Mr. Leech included re-electing FRANK B. WHITING chairman of the board, adding the duties of treasurer to the office of president GEORGE A. WHITING and appointing JOHN HOERRES secretary.

HAMILTON S. CRAIG, director of service operations for Canadian activities of Kimberly-Clark Corp., is leaving the Toronto headquarters of the company March 1 for Neenah, Wis., to join the engineering department. He was general manager of the Long Lac Pulp and Paper Co. at Terrace Bay from 1945 to 1949.

GORDON ROOT, who has taken over the post of director of public relations for the Celgar Development Co., Castlegar, and the Columbia Cellulose Co., Prince Rupert, recently spent some time in the Arrow Lakes area.

While in Nakusp he stated that the new Celgar development would create employment for 2200 men and women, of whom approximately half would be engaged in the pulp mill and allied development, while the others would be engaged in the supply of logs. He said the site was regarded as ideal because of readily available fuel and good transportation, while logs could be floated down the Arrow Lakes basin.

R. A. McDONALD, executive vice-president of the Crown Zellerbach Corp., was named Assistant Administrator of the National Production Authority on February 12. He will be in charge of the Industrial and Agricultural Equipment Bureau.

As head of this Bureau, Mr. McDonald will direct the work of ten industry divisions: Agricultural Machinery and Implements; Construction Machinery, Electrical Equipment, Engine and Turbine; General Components; General Industrial Equipment; Metal-

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Mr. McDonald comes to NPA in accordance with the rotation program under which leading U. S. businessmen are asked to serve in certain NPA and DPA positions which call for highly specialized experience and background.

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MERRICK SCALE MFG. CO.
PASSAIC, NEW JERSEY

CHARLES M. KOON will return from France early in March to take a position with The Oxford Paper Co. to supervise its Technical Service Department at Rumford, Maine. Mr. Koon is a graduate of the New York State College of Forestry at Syracuse University and for six years was a Research Assistant at The Institute of Paper Chemistry at Appleton, Wis. He has been associated with The Champion Paper and Fibre Co., Canton, N. C., and The Munising Paper Co., Munising, Mich., where he was technical superintendent. For the last two and a half years Mr. Koon has been Acting Chief of the Pulp, Paper and Timber Sevtion of the ECA in Paris, France.

C. J. O'NEIL has been appointed to the newly created post of merchandise manager for the Johns-Manville Celite (diatomaceous silica) Division.

Mr. O'Neil's new post was created to extend distribution of the company's Celite fillers and filter aids produced at the company's diatomite mine and plant in Lompoc, Calif., so as to fill shortages created by unusually heavy industrial requirements.

Expansion at the company's Lompoc mine and plant to meet heavy industrial demands includes a new calcining system with a rotary kiln 10 feet in diameter by 110 feet long which is expected to increase diatomite output by 40 percent over current levels.

SAMUEL P. BROWN on February 1 became a partner in the firm of Coverdale and Colpitts, Consulting Engineers, 120 Wall St., New York, N.Y.

S. E. WILLIAMS has been appointed vice-president and general manager of the St. Lawrence Corp., Ltd. E. P. WILSON has been named vice-president in charge of Kraft and Board Division, and J. W. FRIES, vice-president in charge of Woodlands Operation.

WILLIAM J. ALFORD, III, president of Alford Cartons, Ridgefield Park, N. J., has been elected deputy chairman of the board of directors of Thames Board Mills, Ltd., Purfleet, England, reported the largest producers and converters of paperboard in the British Isles and one of the largest in the world.

A. R. WEBB, superintendent, Vancouver Converting plant of Pacific Mills Limited, has been elected chairman of the Lower Mainland Branch of the Pulp and Paper Industry Technical Assn. at Vancouver, B. C.

LOUIS PUMPHREY, superintendent, Westminster Paper Co. mill, has been elected vice-chairman, with MEL OKE as manager. The organization will make an official visit to pulp and paper mills at Bellingham, Wash., during February.

JAMES H. PERRY, Norton Co.'s pulpstone sales engineer, has been made secretary of the Ground Wood Pulp Committee of the Technical Assn. of the Pulp and Paper Industry. Mr. Perry is an expert on the use of ground wood pulp in the pulp and paper industry. He has been with Norton since January 1944, after a number of years with two leading paper mills in the United States.

AMERICAN PAPER AND PULP ASSOCIATION'S PAPER PRODUCTION RATIO REPORT

(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

	Jan. 26	Feb. 2	Feb. 9	Feb. 16	Feb. 23*
1952	99.5	98.1	99.3	97.5r	97.3
	Jan. 27	Feb. 3	Feb. 10	Feb. 17	Feb. 24
1951	101.0	100.2	98.4	102.1	102.4

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1951*	99.3	101.3	101.9	102.8	102.2	100.1	88.6	97.7	94.3	100.6‡	98.2‡	89.3‡	98.4‡
1952*	97.6‡												

COMPARATIVE YEARLY SUMMARIES

	1945	1946	1947	1948	1949	1950*	1951*	1952*
Year to Date	87.9	95.2	104.6	100.6	94.2	94.1	100.3	97.9
Year Average	89.4	101.1	104.3	96.2	88.6	95.8	98.4‡	

‡ Preliminary.
r Revised.
* Weekly capacity base increased by 4,554 tons.

PAPERBOARD OPERATING RATIOS†

	Jan. 26	Feb. 2	Feb. 9	Feb. 16	Feb. 23
1952	85	85	85	87	87
	Jan. 27	Feb. 3	Feb. 10	Feb. 17	Feb. 24
1951	104	103	104	105	105

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Ave.
1951	102	105	104	105	104	103	84	94	86	87	82	75	94
1952	81												

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

† Per cents of operation based on "Inch-Hours" reported on a 6-day basis to the National Paperboard Association.

CLEARING HOUSE

HELP WANTED

MEN WANTED—POSITIONS OPEN

We can place—Manager unbleached sulphate pulp mill; general supt. large paper and pulp mill; Cylinder board mill supt.; night supt. Fourdrinier machine mill; manager or supt. also salesman or sales mgr. for wet machine fibre board mill; asst. to gen. mgr. Yankee Fourdrinier paper mill; supt. finishing, large plant.

Chemists, chemical engineers and laboratory men for mills also for demonstrating and selling; master mechanics and plant engineers up to $10,000 year; maintenance foreman; Cylinder, Fourdinier and Yankee Fourdrinier machine foremen; machine tenders and back tenders.

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SPECIALISTS IN PLACING AND IN SUPPLYING PULP AND PAPER MILL EXECUTIVES

M-7

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WANTED: Superintendent of Finishing in a mill making diversified grades of specialty papers. Require a superintenedent with initiative and supervisory ability. Acquaintance with converting equipment desirable. Fine opportunity for an efficient and capable man. Address Box 52-93 care Paper Trade Journal. M-28

We are looking for an experienced glue department foreman who can train and direct his employees successfully. This opening in our organization is a top position. Extremely attractive earnings and advantages. Your reply will be kept confidential. Our employees know of this ad. Address Box 52-88 care Paper Trade Journal. M-14

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Fully experienced on folding boxboards. Good opportunity, steady job with plenty overtime in one machine mill. Only applications outlining full qualifications and experience will be considered.

Miami Paper Board Mills, Inc., Box 197, Int'l Airport, Miami, Fla.

M-21

GOOD OPPORTUNITY for Working Machinist capable of supervising new tissue converting plant in New York City. Write full details to Box 52-95 care Paper Trade Journal. M-7

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SALARIED POSITIONS $3,500 to $35,000. We offer the original personal employment service (established 42 years). Procedure of highest ethical standards is individualized to your personal requirements Identity covered; present position protected. Ask for particulars. R. W. BIXBY, INC. —117 Dun Bldg., Buffalo. 2, N. Y.

M-7

WORKING SUPERINTENDENT for small fast growing Eastern mill making lightweight specialties. Cylinder machine experience essential. State qualifications and salary expected. Address Box 52-76 care Paper Trade Journal. TF

WANTED—MASTER MECHANIC—practical engineer to supervise plant maintenance. Pulp or paper mill background essential. Fine opportunity and desirable salary. Mill located in Massachusetts. All replies confidential. Address Box 53-73 care Paper Trade Journal. TF

POWER PLANT ENGINEER wanted to take complete charge of Power Department. Give complete information in first letter. Address Box 52-78 care Paper Trade Journal. M-14

PAPER AND PULP MAN—Experienced in the export field, wanted by export firm in New York. Address Box 52-63 care Paper Trade Journal. M-7

PLANT ENGINEER—Opportunity for qualified graduate Engineer with extensive experience in general plant engineering and operations in the Pulp and Paper Industry and particularly the kraft process. Address Box 52-2 care Paper Trade Journal. TF

FINE PAPER MANUFACTURER with national distribution wishes to expand their sales force. State experience, references and compensation wanted. Address Box 52-89 care Paper Trade Journal. M-14

SALES ENGINEER—Midwestern manufacturer of pulp and paper mill specialty machinery wants personable young man with mill experience to work in sales department. Approximately two-thirds of time will be spent at home office handling correspondence with customers. One-third of time will be spent in traveling. Give full details of personal, education and experience background. Address Box 52-91 care Paper Trade Journal. M-21

SITUATIONS WANTED

MECHANICAL ENGINEER — 25 years experience in administration, engineering, manufacturing and converting creped tissues and specialists, desires position in top engineering or management. Presently employed. Address Box 52-69 care Paper Trade Journal. M-7

GRADUATE MECHANICAL and Chemical Engineer desires position. 25 years experience in Pulp and Paper Mills. A-1 references. Progressive. Address Box 52-83 care Paper Trade Journal. M-7

SERVICES of Experienced Chemical Engineer available on reasonable basis for consultation on successful design, construction and operation of deinking and bleaching plants either projected or existing. Address Box 52-86 care Paper Trade Journal. M-28

SITUATIONS WANTED

Paper Mill Supt. 30 years experience and I.C.S. Courses wishes to make change with company wishing to operate at highest possible degree of efficiency on fourdrinier grades Book, Bond Writing, ground wood specialties, News and kraft. Will go anywhere at once. Write Box 52-87 care of Paper Trade Journal. M-14

PLANT MANAGER—Well known expert on specialty bags, printing, engineering and designing, soon available. Address Box 52-94 care Paper Trade Journal. M-7

THOROUGHLY experienced Tour Foreman desires new connections. Thirteen years as operating foreman in Kraft Pulp Mills, also have had bleaching experience. Have worked in Eastern and Western Canada. Would consider taking position with new, aggressive, expanding firm with opportunity of advancement. Address Box 52-90 care Paper Trade Journal. M-7

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Purchasers of all Types of Paper

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SU. 7-7849

M-7

FOR SALE—52" Cameron type 8 Model 5 Slitter; 48"Kidder Model CH shear cut slitter; 76" Cameron Rewinder; 75" Moore & White Upright 2 drum Reel; 42" Moore & White Sheeter; 100" Dillon Sheeter. Thomas W. Hall Company, Inc., 120 West 42nd St., New York, 18. TF

PAPER COATING MACHINERY MANUFACTURERS — Waxing, Oiling, Carbon Laboratory Coating and Treating and Flat Ream Measuring and Converting Machines. New improvement. THE MAYER MACHINE COMPANY, INC., 1313 Buffalo Road, Rochester, 11, N. Y. TF

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OPPORTUNITIES—75c a line. Minimum charge $3.75.

Classified advertising space may also be purchased at $5.00 per single column inch. All classified advertisements are payable in advance.

If box number is used—70 cents additional

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FOR SALE

FOR SALE

40—P & J Dryers 48x160"
34—Horne Dryers 48x124"
32—Horne Dryers 48x118"
5—M & W Dryers 60x174"
2—124" Calenders, one nine roll and one seven roll
1—30x162" suction couch roll
1—14x104" suction couch roll
1—66" nine roll Holyoke supercalender
1—Ten knife 84" Carthage chipper
1—4 ft. x 6 ft. Oliver filter
6—Noble & Wood fibre selectors, new 1947

FRANK H. DAVIS COMPANY
Established 1889
175 RICHDALE AVENUE
CAMBRIDGE 40, MASS. M-21

1—6 Ton Fourdrinier Facial Machine with enclosed drives.
2—No. 2-A Bird Screens
10—48" dia. 118" face Dryers
1—24" dia. x 133" face Sandusky Suction Roll
1—124" face 9-roll Calender Stack
1—42" Cameron Rewinder

OSBORNE PAPER MILL EQUIPMENT CORP.
Fulton, N. Y. Tel. 2-4254
M-7

FOR SALE—New combination Bag Machine, reasonable. Would be interested in proposition to set up and operate. Address Box 52-85 care Paper Trade Journal. M-14

FOR SALE

SPECIAL

1—94" Beloit heavy duty paper machine winder with rider roll. Used less than 1 year. Large diameter individually motor driven slitters. Price less than ⅓ today's cost.

OSBORNE PAPER MILL EQUIPMENT CORP.
Fulton, N. Y. Tel. 2-4254
M-7

FOR SALE—Selling out Set-up Box and Converting Plant with well known and standard makes, models, in all sizes of Slitters & Rewinders; Beck Sheeters; Thomson Die Cutters; Rotary Slitter/Scorers; S & S Wrappers & Gluers; Sgle. & Dble. Corner Cutters; Sgle. & Quad Stayers; Stitchers; Bdle. Tyers; and many other PAPER CONVERTING & FINISHING MACHINES. Write for listings. Address Box 52-51 care Paper Trade Journal. TF

WANTED

WANTED—Small Eastern Paper Mill currently operating. Principals only. Address Box 52-82 care Paper Trade Journal. M-14

WANTED TO PURCHASE—Late Model 13½" ¼ fold Napkin Machine or Dispenser. Address Box 52-84 care Paper Trade Journal. M-7

WANTED

For Sale and Wanted all grades

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557 Water St., N. Y. ORegon 3-6160-1-2-3
Inquiries Solicited M-7

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CANCELLED—UNSHIPPED
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CHEMICALS—DYES—
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We are always in the market to purchase your surplus or idle machinery. What have you to offer?
Wanted Cylinder and Fourdrinier Machines (complete mills).

FOR SALE

BEARINGS
72—Top and bottom Dryer Bearings 7" diameter x 12" long.

BEATERS
1—Dilts Iron Tub Laboratory Beater. Beater roll 14" diameter x 10½" face.
1—Laboratory Beater, 1 lb., complete with motor.

CALENDER STACKS
1—9 roll 58" Calender Stack.
1—72" 4 roll calender stack. (Extra heavy duty).
1—54" Smoothing Calender Stack, 2 Iron Rolls, 2 Cotton Rolls.
1—60" 3 roll friction calender stack. All iron rolls.

CHEST
1—Cast Iron Stock Chest, 25' long x 6' high. (With agitator).

CHIPPER
1—96" Murray 4 knife Chipper—anti-friction bearings.

CLASSIFINER
1—Dilts Classifiner, practically new, with motor.

CRUSHER & HAMMERMILL
1—Murray Chip Crusher.
4—Jeffrey Hammermill.

CYLINDER MOLDS
2—30" diameter x 72" face.
1—36" diameter x 79" face.
4—36" diameter x 54" face.
1—36" diameter x 96" face.
1—48" diameter x 72" face.
1—30" diameter x 92" face.
1—42" diameter x 120" face.
4—42" diameter x 130" face.
1—48" diameter x 117" face.
2—36" diameter x 110" face.

DRIVES
1—Jones Reducer 75 h.p.—30.8 to 1.
1—#6½ Reeves Drive.
1—#4 Reeves Drive
1—Reliance Electric Drive, complete with 5 gear head motors.
1—#3 Reeves Drive (totally enclosed).

DRYERS
1—Complete unit, consisting of 6 dryers, 36" diameter x 38" face, including frames, gears, anti-friction bearings.
7—24" diameter x 48" face.
1—36" diameter x 143" face.
1—48" diameter x 70" face.
2—Dryers 48" diameter x 134" face.
1—24" diameter x 92½" face.
2—28" diameter x 48" face.
8—24" diameter x 60" face.
1—20" diameter x 61" face, complete with frames.
1—36" diameter x 67" face.
1—84" diameter x 48" face.
3—48" diameter x 88" face, with bearings and gears.
1—48" diameter x 136" face.

FLAT SCREENS
1—6 plate Shartle Flat Screen.
2—Packer, 12 plate, roller shoe type.
1—6 plate Sandy Hill (Packer).

FOURDRINIER PARTS FOR 134" MACHINE
6—Suction Boxes, 34 table rolls, Brass Slide Rails.

GEARS
50 gears, for 36" diameter Dryers, 108 teeth 3½" face.

GUILLOTINE CUTTER
1—60" Cutter.

JORDANS
1—Horne Jordan.
2—#1 Jones High Speed Jordans, with 75 h.p. motors, new 1948.
4—Noble & Wood Mammoth.

LIME SLUDGE FILTERS
2—IMPCO Lime Sludge Filters, vacuum type. 5' diameter x 4' face.

MOTORS
Write us regarding your requirements.

PRESSES
3—Sets Primary Presses, complete, 145" face. Anti-friction bearings. Also all types of rolls for 145" wet end.

PULLEYS
Various cone and assorted pulleys.

PULPERS
1—Jones Pulper. Complete with motor and drive.
1—Noble & Wood Pulper—Iron Tub.
1—Lannoye Pulper.

PUMPS
1—Gould Triplex Hydraulic Pump, 2 x 6, 1750# pressure.
Various sizes of Centrifugal and Plunger Pumps. Write us regarding your particular requirements.
3—Shartle Brothers circulating pumps, each 4,000 g.p.m.
1—Frederick, 8 x 12, with motor.
1—Shartle, 8 x 14, 2000 g.p.m., 62' head, direct connected to circulating pump, with motor.

REELS
1—123"—3 bowl Revolving Reel.
1—72" Dowingtown Reel, 2 bowl.

REFINERS
2—#1 Claflin Refiners.

ROLLS
Felt, Table, Press, Breast, Couch, etc. Various sizes and types. (Bronze, Rubber, Iron, etc.)

ROTARY SCREENS
1—#2 Bird Rotary Screen.

SAVEALLS
1—#5 Bird Saveall.
2—Savealls, 36" diameter x 136" face cylinder molds, iron end vats.

SHEETER
1—65" Clark Sheeter, 8 roll backstand.

SHREDDERS
2—Daniels Rag Cutters.

SLITTERS & WINDERS
1—115" 2 drum Waldron
2—112" Cameron—Type 18.
1—104" Beloit two drum winder.
1—92" Moore & White 4 drum winder.
1—82" Cameron—Type 10-10.
1—72" Cameron—Type 8-10.
1—72" Cameron—Type 10.
1—62" Cameron—Type 26-3A.
1—62" Cameron—Type 8-10.
1—62" Cameron—Type 10.
1—60" Langston (Shear cut).
1—52" Cameron—Type 6.
2—42" Cameron Type 40-1-AF
2—42" Cameron—Type 6.
1—42" Cameron Constant Tension with pneumatic control.

STOCK PUMPS
1—10 x 20 Shartle Duplex.
1—7 x 16 Shartle Duplex.
2—10 x 10 Beloit Duplex, low type, with motors.
Advise as to your requirements.

SUCTION COUCH ROLL
1—Sandusky Couch Roll 126" drilled face x 22" diameter.

SUCTION BOXES
5—136" face Suction Boxes.
6—140" face.

TABLE ROLLS
29—5" diameter x 138" face.

THICKENERS
1—Pulp Thickener, cylinder mold 48" x 117" with spare cylinder molds.

TOILET WINDERS
2—72" Hudson-Sharp (Surface type winder).

VACUUM PUMPS
1—L-4 Nash Vacuum Pump.
1—N-82 Nash, for Fulton-Midwest System.

YANKEE DRYERS
1—48" Face x 84" Diameter, Frames & Bearings.

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Monsanto Chemical Co.
Morningstar, Nichol, Inc.
National Starch Products, Inc.
Nopco Chemical Co.
Plaskon Division, Libbey-Owens-Ford Glass Co.
Reichhold Chemicals, Inc.
Rohm & Haas Co.

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Midwest Fulton Mch. Co.
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Moore & White Co.
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The Sandy Hill Iron & Brass Works
Valley Iron Works Co.
Shartle Brothers Machine Co.

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National Aluminate Corp.
Nopco Chemical Co.

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Williams-Gray Co.

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Dilts Machine Works
Potdevin Machine Co.
H. G. Weber & Co., Inc.

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Combustion Engineering-Superheater, Inc.
Nichols Engrg. & Research Corp.

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Carthage Machine Co.
Improved Paper Machinery Corp.
D. J. Murray Mfg. Co.
The Noble & Wood Machine Co.
Valley Iron Works Co.

BARS
Dilts Machine Works
E. D. Jones & Sons Co.
Midwest Fulton Mch. Co.
The Moore & White Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

BASIC WEIGHT SCALES
Thwing-Albert Instrument Co.

BEARINGS
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Black Clawson Company
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Magnus Metal Corp.
The Moore & White Co.
The Noble & Wood Machine Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
SKF Industries
Timken Roller Bearing Co.
The Torrington Co.
Valley Iron Works Co.

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The Appleton Machine Co.
Black Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Midwest Fulton Mch. Co.
Morden Machines Co.
The Noble & Wood Machine Co.
J. J. Ross Company
Ross Paper Machy. Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

BED PLATES
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Dilts Machine Works, Inc.
Downingtown Mfg. Co.
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Lukenweld Div., Lukens Steel Co.
Midwest Fulton Mch. Co.
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Rice Barton Corporation
Shartle Brothers Machine Co.
Valley Iron Works Co.

BELTING
Alexander Bros. Belting Co.
Goodrich, B. F., Co.
The Goodyear Tire & Rubber Company

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Niagara Alkali Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

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Carthage Machine Co.
Kalamazoo Tank & Silo Co.
Moore & White Co.
Murray Mfg. Co., D. J.
Walworth Company

BOARD MACHINES
The Noble & Wood Machine Co.

BOILERS
Babcock & Wilcox Co.
Biggs Boiler Works Co.
Combustion Engineering-Superheater, Inc.

BOTTOMS
Kalamazoo Tank & Silo Co.
Valley Iron Works Co.

BOXBOARD SCALES
Thwing-Albert Instrument Co.

BRUSH ROLLS
M. W. Jenkins Sons, Inc.
Gus Reidel & Son

BRUSHES
M. W. Jenkins Sons, Inc.
Gus Reidel & Son
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.

BURSTING TESTERS
B. F. Perkins & Son Inc.
Testing Machines, Inc.

CALENDERS
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Beloit Iron Works
Black Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
Lobdell United Co.
Edward J. McBride
The Moore & White Co.
Perkins & Sons, Inc., B. F.
Rice Barton Corporation
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

CARRIER ROPE
Williams-Gray Co.

CASEIN
American Cyanamid Co.
Industrial Chem. Div.
Hercules Powder Co.

CASTINGS
Appleton Machine Co.
The Bagley & Sewall Company
Black Clawson Company
Babcock & Wilcox Co.
Carthage Machine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Hamblett Machine Co.
Lobdell United Co.
Magnus Metal Corp.
Michigan Steel Casting Co.
The Noble & Wood Machine Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Walworth Company

CENTRIFUGAL MACHINERY
Bird Machine Co.
Nichols Engrg. & Research Corp.
Ross, J. O., Engrg. Co.
Shartle Brothers Machine Co.

CHAINS
Jeffrey Mfg. Co.

CHEMICAL COTTON PULP
Hercules Powder Co.

CHEMICALS
American Cyanamid Co., Industrial Chem. Div.
Calco Chemical Co.
Calgon, Inc.
Diamond Alkali Co.
Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
General Dyestuffs Corp.
Geigy Co., Inc.
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Gottesman & Co.
Hercules Powder Co
Heyden Chemical Corp.
Hooker Electrochemical Co.
The Kinsley Chemical Company
Monsanto Chemical Company
National Aluminate Corp.
Naugatuck Chemical Division of U. S. Rubber Co.
Niagara Alkali Company
Nopco Chemical Co.
Pittsburgh Plate Glass Co., Columbia Chemical Division
Reichhold Chemicals, Inc.
Rohm & Haas Co.
Virginia Smelting Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

CHESTS
The Bagley & Sewall Company
E. D. Jones & Sons Co.
Kalamazoo Tank & Silo Co.
Midwest Fulton Mch. Co.
The Noble & Wood Machine Co.
Shartle Bros. Mch. Co.

CLEANING MATERIALS
American Cyanamid Company Industrial Chemicals Division
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The Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
General Dyestuff Corp.
Monsanto Chemical Company
Nopco Chemical Co.
Pittsburgh Plate Glass Co.
Wyandotte Chemicals Corp., J. B. Ford Division

CLOTH
Lindsay Wire Weaving Co.

CLUTCHES
Appleton Machine Co.
The Bagley & Sewall Company
Black Clawson Company
Farrel-Birmingham Co.
Hudson-Sharp Mch. Co.
Moore & White Co.
D. J. Murray Mfg. Co.
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Shartle Bros. Mch. Co.

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Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
The Mayer Machine Co., Inc.
Moore & White Co.
Potdevin Machine Co.
Rice Barton Corporation
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Shartle Brothers Machine Co.
Waldron Corporation, John Weber, Herman G., & Co., Inc.

COATING MATERIALS
American Cyanamid Company Industrial Chemicals Division
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E. I. du Pont de Nemours & Co., Inc.
B. F. Goodrich Chemical Co.
The Goodyear Tire & Rubber Company
Hercules Powder Co.
J. M. Huber Corp.
Monsanto Chemical Company
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.
Plaskon Division, Libbey-Owens-Ford Glass Co.
Reichhold Chemicals, Inc.
Wyandotte Chemicals Corp., Michigan Alkali Div.

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Midwest Fulton Mch. Co.

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Bird Machine Company
DeZurik Shower Company
Pandia, Inc.

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O'Donoghue, Roderick
The Rust Engrg. Co.
Shartle Bros. Mch. Co.
J. E. Sirrine & Co.
Frank C. Vaughan
John Waldron Corp.

CONTINUOUS DIGESTER
Pandia, Inc.

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The Brown Instrument Co.

CONTROLS
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Johnson Corp.
Poirier Control Co.
Shartle Bros. Mch. Co.

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Egan, Frank W., & Co.
John Waldron Corp.
Dilts Machine Works

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Ross Engineering Corp., J. O.
Shartle Brothers Mch. Co.

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The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works
Waldron Corp., John

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Whiting Corp.

CURL TESTER
Thwing-Albert Instrument Co.

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Black Clawson Company
Dilts Machine Works
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Rice Barton Corporation
The Sandy Hill Iron & Brass Works
The Smith & Winchester Mfg. Co.
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Improved Paper Machinery Corp.
Manchester Machine Co.
Rice Barton Corporation

CYLINDERS
Biggs Boiler Works Co.
M. W. Jenkins Sons, Inc.

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Valley Iron Works Co.

DECKLE WEBBING
Williams-Gray Co.

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American Defibrator Co.

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Dilts Machine Works
General Dyestuff Corp.
Kinsley Chemical Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DEINKING CHEMICALS
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General Dyestuff Corp.
Kinsley Chemical Co.
Nopco Chemical Co.

DE-MINERALIZING EQUIPMENT
Hungerford & Terry, Inc.

DEMULSIFIERS
Wyandotte Chemicals Corp., Michigan Alkali Div.

DENSOMETERS
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Ebasco Services

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General Dyestuff Corp.
Monsanto Chemical Company
Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

DEWAXING CHEMICALS
American Cyanamid Company Industrial Chemicals Division
General Dyestuff Corp.
Nopco Chemical Co.

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Blaw Knox Company
Chicago Bridge & Iron Co.
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Lukenweld
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General Dyestuff Corp.
Monsanto Chemical Company
National Aluminate Corp.
Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

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Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

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Bird Machine Company
Lodding Engrg. Corp.
The Moore & White Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Simonds Saw & Steel Co.

DRIERS
The Bagley & Sewall Company
Biggs Boiler Works Co.
Black Clawson Company
Downingtown Mfg. Co.
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Lukenweld
The Moore & White Co.
Murray Mfg. Co., D. J.
J. J. Ross Company
Red-Ray Mfg. Co., Inc.
Rice Barton Corporation
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

DRIERS—LABORATORY
The Noble & Wood Machine Co.

DRILLED SUCTION COUCH ROLLS
Manchester Machine Co.

DRILLED SUCTION DRUM ROLLS
Manchester Machine Co.

DRIVES
Appleton Machine Co.
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Beloit Iron Works
Bird Machine Co.
Black Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Jeffrey Mfg. Co.
General Electric Company
Gibbs-Brower Company, Inc.
Moore & White Co.
Murray, D. J., Mfg. Co.
Pusey & Jones Corp.
Rice Barton Corporation
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Shartle Bros. Mch. Co.
Valley Iron Works Co.

DRUM WINDERS
Manchester Machine Co.
Rice Barton Corporation

DRYER ROLL PYROMETER
Midwest Fulton Mch. Co.
Thwing-Albert Instrument Co.

DUSTERS
Appleton Machine Co.
Downingtown Mfg. Co.
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M. W. Jenkins Sons, Inc.
E. D. Jones & Son Co.
Moore & White Co.
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Thwing-Albert Instrument Co.

EMBOSSING MACHINES
Dilts Machine Works
Egan, Frank W., & Co.
John Waldron Corp.

EMBOSSING ROLLS
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Gibbs-Brower Company, Inc.
Holyoke Machine Co.
B. F. Perkins & Son, Inc.
John Waldron Corp.
Wheeler Roll Co.

EMPLOYMENT SERVICE
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Raymond, Chas. P., Service, Inc.

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Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp.

ENZYMES
Rohm & Haas Co.
Vanderbilt Co., R. T.

EVAPORATORS
Biggs Boiler Works Co.
Goslin-Birmingham Mfg. Co., Inc.
Murray, D. J., Mfg. Co.
Swenson Evaporator Co., Div. of Whiting Corp.

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FANS
General Electric Co.
B. F. Perkins & Son, Inc.
Ross Engineering Co., J. O.

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Merrick Scale Mfg. Co.
The Permutit Company

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Asten-Hill Mfg. Co.
Draper Bros. Corp.
Huyck & Son, F. C.
Lockport Felt Co.
Morey Paper Mill Supply Co.
Shuler & Benninghofen
Waterbury Felt Co.
Waterbury, H., & Sons Co.
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FELT CLEANERS
Calgon, Inc.
General Dyestuff Corp.
Nopco Chemical Co.

FELT CONDITIONERS
Bird Machine Co.
The Noble & Wood Machine Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works

FELT GUIDES
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Frank W. Egan & Co.
Gilbert & Nash Co.
Moore & White Co.
The Noble & Wood Machine Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

FIBRE BOARD MACHINES
The Noble & Wood Machine Co.

FILLERS
American Cyanamid Company, Industrial Chemicals Division
J. M. Huber Corp.
A. M. Meincke & Son, Inc.
Vanderbilt Co., R. T.
Wyandotte Chemicals Corp., Michigan Alkali Div.

FILTERS
Bird Machine Company
Holyoke Machine Co.
Hungerford & Terry, Inc.
Improved Paper Machinery Corp.
Johnson Corp.
Moore & White Co.
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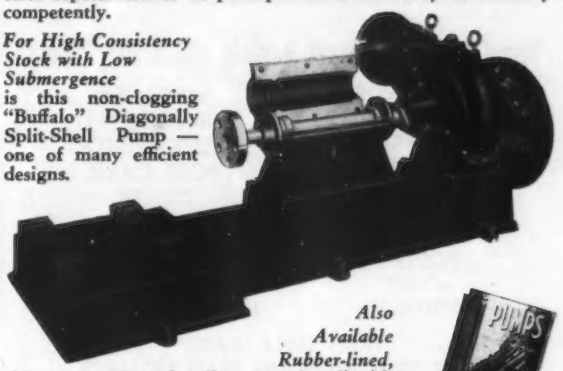

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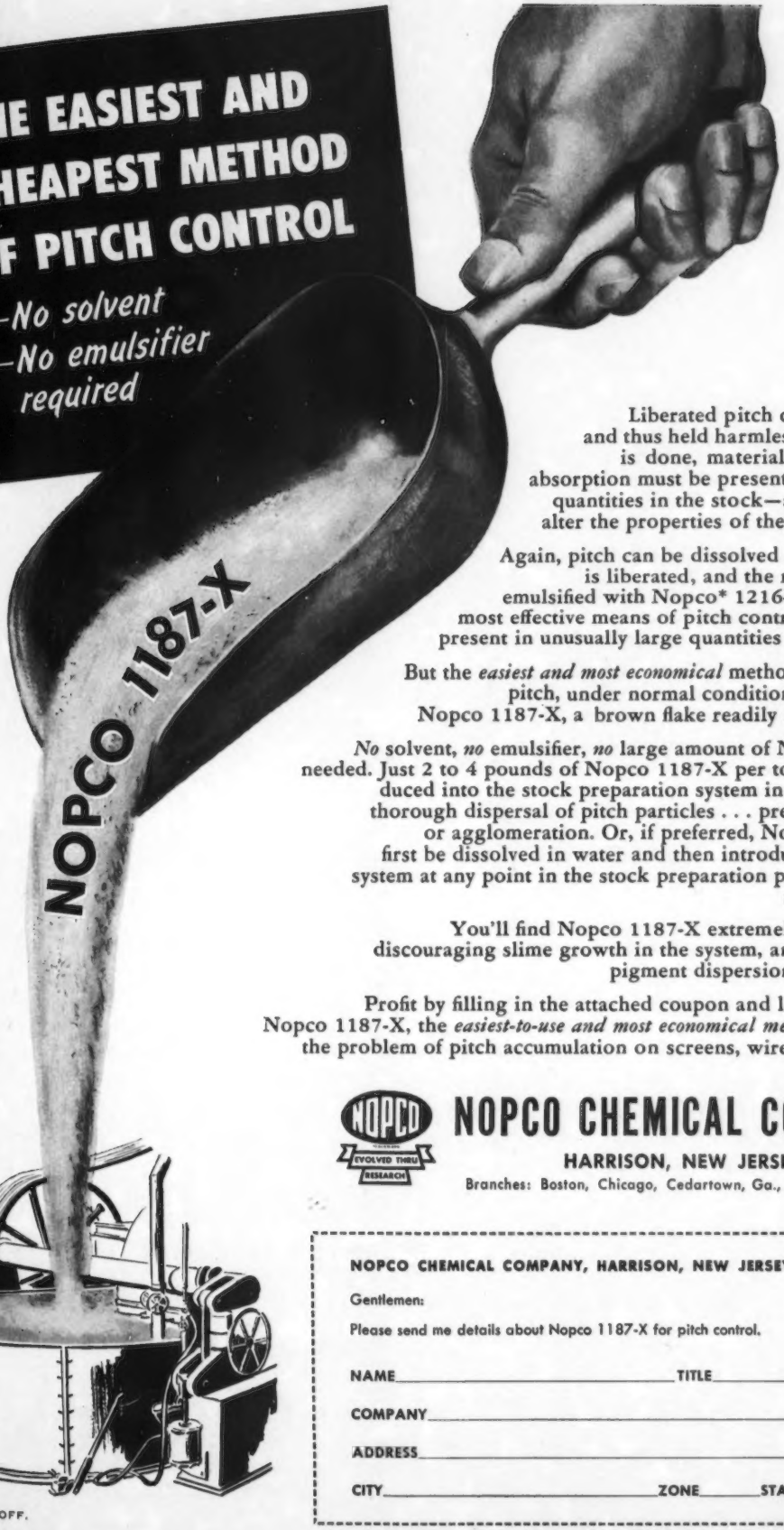

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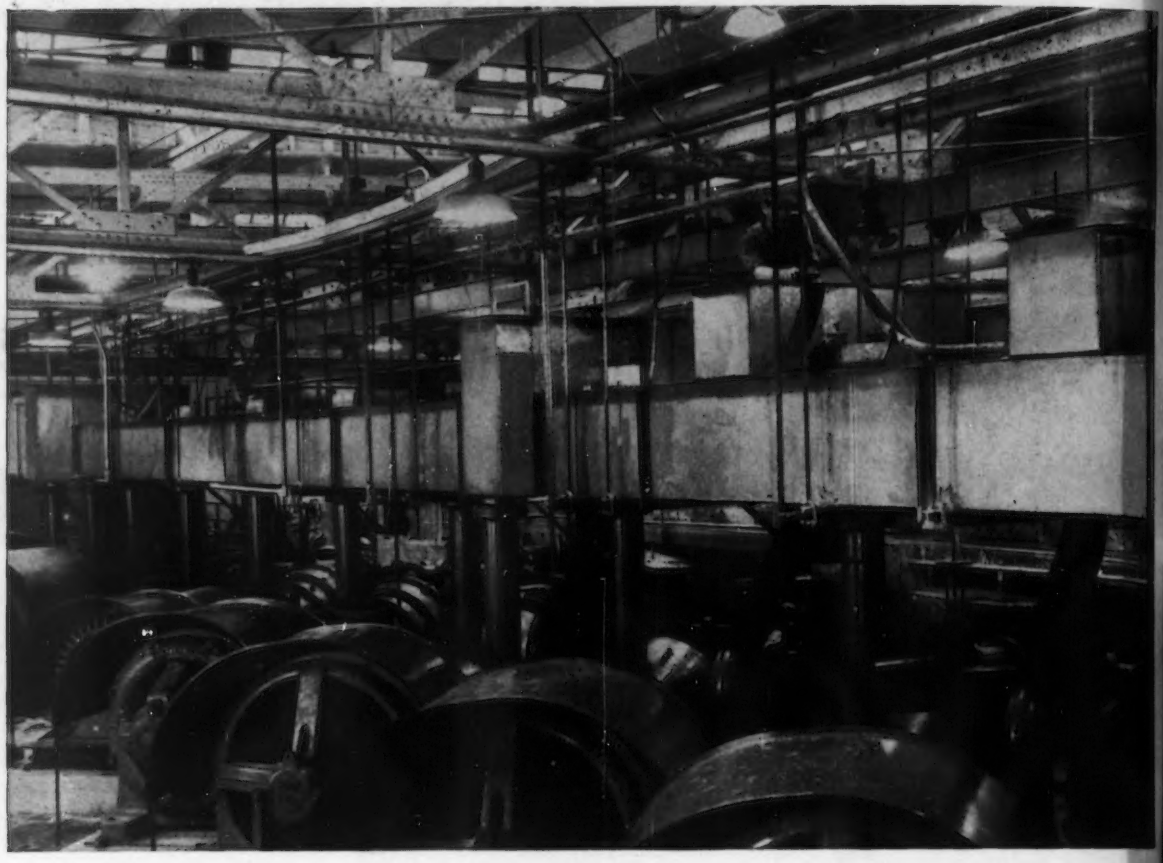

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